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APRIL 13, 1953

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CRM ADDRESS PATTERN

July 16, 1952.

Mr. Stuart Grant,
Advtg. and Sales Promotion Mgr.,
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Frequency

ad gallery

A. Goldberg,
Superintendent of Maintenance.

106

NEWS DIGEST



NEW 3-D 4000 V-AUTOUR brings night fighter and ground-support plane display detecting characteristics to the first photo of

visual plane found in Aviation Week, Nov. 3, p. 131. Note the dual beamers where more leading gear and smaller

wings, which fold into engine nacels. Padoche's powerplants are 4,000 lb. And 3000.

relationships for study in airplane engineering and manufacture.

Export sales of civil aircraft last February totalled 38 planes valued at \$334,237, nearly double the \$171,137 value of 24 units exported during the preceding month, according to ADA.

Navy's 2596 intercepting jet Cougar was tested recently by Grumman Aircraft Engineering Corp., Bethpage, N.Y.

Financial

Northwest Airlines earned a net income after taxes of \$1,799,357 last year from revenues totaling \$61,552,184. 1951 net income was \$1,235,471 from revenues of \$6,567,320.

Capital Airlines reports a \$5,016,001 total for February operating revenues, highest for that month in the carrier's 26-year history.

International

Scandinavian Airlines has taken delivery of its second 77-seat Douglas DC-4E. By May 15, the carrier is scheduled to receive six of eight DC-4Es on order, enabling Scandinavian to increase New York-Scandinavia flights to once a week and permitting a 75% boost in trans-Atlantic seat capacity over last year.

Five Convair Liner 360s have been ordered by Royal Transportes Aereos for operation over the Bolivian airline's domestic routes and to Uruguay and Paraguay.



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The Aviation Week

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Washington Roundup

Peace and Economy

To late developments indicate the Administration is going to come back with a straightforward defense program cutting deeper than the \$4 billion Truman budget or the \$5 billion contemplated only a few weeks ago.

Stock is being placed on Russia's peace offensive in calculating defense requirements. This doesn't mean the Administration has thoughts of shrinking defense and saving for its oil peace. In fact, reductions such as Armed Services Committee chairman Sen. Leverett Saltonstall are continuing on the need to keep up a strong defense posture. But, poems such as these are being made:

• That Russia's peace approach, supported by more than words, probably takes some of the agency out of the defense posture.

• That in aid to a shooting war in Korea automatically cuts the defense requirement by eliminating battle losses.

• That these two factors point to a switch in defense emphasis, such as for example, more emphasis on guided missile research and less on fixed ground.

Secretary of Defense Charles E. Wilson plans to cut the extra costs of keeping up a broad industrial base and arm, instead, at getting and staying in efficient and non-combative as possible. Whether it meets with President's approval, this position is likely to doze substantial support in Congress. Sen. Mills Bridges, chairman of the Appropriations Committee and an Armed Services subcommittee on small government, plans to go into the question of spending around and third production sources.

Defense and Politics

Defense is tested with politics, both domestic and international, up on Capitol Hill.

• Sen. Sherman cited the following pro speech by Democratic spokesman Sen. Lyndon Johnson and Sen. Stuart Symington—questioning the adequacy of defense. If there is any inadequacy, it isn't due to the Eisenhower Administration.

He commented in a letter, made public, querying the President on the status of defense: "I do not feel that the situation has deteriorated during the past few months to a degree which calls for some special apprehension not previously manifested."

• Major General Johnson, in a public speech, modified his basic position for the status of defense and warning against a leaders.

A few weeks back, Johnson put forth such warning questions as: "Does an aggressor within have the power to neutralize the strength of the United States can be attributed at any and every point? Do we have a force that could deliver devastating destruction against an enemy at home we place our faith in equipment that is obsolete?"

Last week, he appeared to have the answer, when he told an audience: "We must not lightly cast aside the game we have been making in the creation of a national defense program so far reaching that no tyrant will willingly take steps to plunge the world into war." He added: "We must not let down. We must make certain that we do not let these most potent Comintern voices tell us to fold up our military strength."

Johnson's switch from offensive to defense on military

soberification is a sign of the trend to follow. Too talk of "dissolving armaments" would be an aptopic reply to peace slogan.

President Takes Control

President Eisenhower, with the advice of an anti-city functionary, National Security Council, has taken a firm hold on the defense program. Indoors:

• The President fully stated to a war conference that he—and not Pentagon chiefs—could determine the level of combat forces. He would not delegate the authority, he said.

• He pointed to his personal interest in a letter to Sen. Saltonstall: "It is necessary for me to lay the problem of the nation's security has been my paramount concern during the first two months of this Administration."

• The President pointed to the Security Council, not Defense Department, as reply to Saltonstall's expression of concern over the status of defense.

"One of my first concerns was to devise means to improve and strengthen the operation of the National Security Council."

"Since my inauguration, the council has worked steadily and intensively. Due to two meetings per week are the rule. . . You will see us this schedule that we are devoting concentrated attention to solving the problem."

"In addition to evaluating the status of the nation's security, the council at the end of April and of 1952, the council has been apprised the cost of the security program, the amount of that cost on the nation's economy, and the value obtained for the money expended, in terms of the current war and of subsequent peace."

• The President made one final intention of Defense Department in his reply: "You are also aware of the study now in progress in the Defense Department on the reorganization phase of the problem affecting that department?" But the President made it clear that he and the council would "evaluate" the security for "broad doctrinal" organizational changes in well as "colorized risks" to be taken in the defense program.

This marks a change from the Truman Administration. Over the past few years, Pentagon has handled out its own program, without an overall call when the Korean war was hot and with a cooling when it cooled. White House generally kept "hands off" and budget Bureau seems a little more than a sound check on defense budget items.

A likely result of the new top job for National Security Council: The defense program will be limited to the review, instead of the term "National interests" increasingly dominant.

• Security of Defense is the only authority whose peace concern is U. S. naval strength. Others, who will now have a strengthened role in defense matters: Vice President, Secretary of State, Secretary of Treasury, Director of National Security and Director of Defense Mobilization.

• Civil military participant will be the Chairman of the Joint Chiefs of Staff, who will attend as an adviser.

• Further diluting the voice of the military, teams of presidential appointed civilians periodically will serve in consultants to the council. The first team which just completed their tour's consultant service, included a utility executive, a chemical company executive, a newspaper publisher, a labor leader, a minority president.

—Katherine Johnson

INDUSTRY OBSERVER

► Republic Aviation's F-84F Thunderstreak is currently refitted at Mach 1.15. Thrustreverser is reduced at from 5,000 to 7,250 rpm, and again at around 10,000 rpm. Normal cruise for the British Supersonic is 5,000 rpm, normal cruise for the Wright J65 version of the Supersonic is 5,000.

► British Aircraft has a project in R&D the T-36A trainer with turbojet engines. This version would be known as the T-36X.

► Novo has confirmed Aviation Week's prediction (Apr. 5, p. 13) that the Convair F-106A Jato-boost production program would be discontinued and only a dozen service test models built. Some of the reported difficulties in the aerodynamically balanced "jettison" tail on the Jato-boost are expected to be solved by switching to a conventional horizontal tail.

► CAA is preparing a flight test program with a Hydro-Canad aircraft with variable leading edge device on one of its DC-4s at Oklahoma City flight test center. Northwest Airlines is operating the device on its Boeing Stratocruisers.

► De Havilland is studying a modification of the wing air intakes for the Comet's Ghost trouble to provide more air during takeoff when the wing is at a high angle of attack. Comet operations to date indicate the high angle of the wing across part of the inlet during takeoff and reduces air flow to the engine.

► Douglas Aircraft's new Navy attack bomber design—the XMD—is scheduled to be powered by advanced versions of the Wright J65 Supersonic rated to deliver approximately 8,000 lb. static thrust.

► Douglas Aircraft's new nosewheel-powered transport, the C-124K, is to be powered by advanced version of the Pratt & Whitney T34 single-unit turboprop that probably will be rated at 6,000 shp. The C-124K will have a completely pressurized fuselage to enable its use as a personnel transport in addition to cargo work at the high altitudes where turboprops are most efficient. The YC-124B to be powered by earlier T34 turboprop will have only a pressurized cockpit and will be used only for cargo or aerial tanker operations.

► Grumman's XSTOL F anti-submarine warfare plane has excited interest among foreign operators for possible modification with a transport to replace the DC-3. Bigger problem would involve fuselage modifications to get the 28 passenger capacity sought by lessees. Don Newell, former CAA director and now Washington representative of local service interests, will discuss the possibilities with Grumman.

► International aviation critics are talking about ICAO Working Paper No. 144, which analyzes 53 airline hours of several engine operations and contains a theory of direct relationship between engine availability and frequency of engine failure, indicating engine failure in flight. The analysis says the Pratt & Whitney R-1830 engine (DC-3) is the most reliable, with a frequency of one failure every 24,000 hr. of engine operation, as compared to P&W's R-4150 engine with one failure every 6,200 engine hours.

► One little-known difference between the British and CAA over jet transport certification is that the British want a speed only 15% higher for the V-2 condition of flight, than for the V-1 aircraft condition, while CAA is holding out for a 20% excess from V-1 to V-2.

► United will modify all its 66-seat, four-seat, three-abreast-wing DC-4s to seven-seat, two-abreast, 64-seat configuration by December. This is the final compromise settlement between CAB and the airline, first reported in Aviation Week Mar. 2, p. 17. United President W. A. Patterson, after seeing a similarly classified NACA cruise-for-motor, last November defied CAB minimum economic certificate seating requirements by setting his planes back to 54 passengers.

WHO'S WHERE

In the Front Office

Thomas A. Murphy has been appointed vice president-special assignments of Republic Corp., Farmingdale, N. Y. He has been succeeded as works manager by D. K. Tasker.

John David Wright is the new president of Thompson Products Inc., Cleveland, succeeding Frederick C. Gossard, who has been named chairman of the board.

C. Hall Miller has resigned his position as executive vice president and general manager of Pascalis Helicopter Corp., Montreal, P.Q.

Willis Please has been named vice president public relations of Northwest Airlines.

Jack C. Allen has been appointed a vice president of Brigham-Bentwood Corp., Phoenix, Ariz.

Delta-C&S Officers

C. E. Wadsworth will be president of the merged Delta and Chicago & Southern Air Lines and Carlton B. Peterson will be chairman of the board of directors after the two carriers are merged, it was said May 1.

Other officers of the combined corporation will be: Wesley A. Stevens, vice chairman and president; Charles H. DeLoach, vice president traffic and sales; Leigh C. Parker, vice president traffic and sales; Thomas M. Miller, assistant vice president traffic and sales; George C. Cooper, vice president finance; Tad G. Cole, vice president production; Richard Moore, vice president legal; Robert H. Wharton, assistant to the president; and W. T. Berke, personnel director.

Changes

Bert J. McManus has been promoted to participating manager of Pratt & Whitney Aircraft, East Hartford, Conn. G. E. Holloman, formerly manager of the plant, is the general manager, and Donald L. Brown is license liaison engineer.

Arthur L. Lulu, former director of Northrop Aircraft guided missile development, has been appointed chief engineer of Ross, Inc., of Ross, Calif. Ross is a division of Northrop Corp. Robert D. Walker has been named director of engineering for the new company.

Robert W. Lulu has been promoted to director of sales for defense and Western Airlines.

William R. Walker is Jack de Henn's new Washington, D. C., director manager.

Joseph M. Robins has joined the Air Transport Assn. as a public information officer.

Paul Bremner and John Morris have been named engineering directors of Western General Aviation, Cincinnati.

Max Van Esen has been appointed purchasing manager of Mohawk Airlines.

G. G. Lodrigus has been promoted to senior manager of the Aircraft Hydraulics Division, Standard Machine Tool Co., Rockford, Ill.

ETTLESS ABOARD A CARRIER AT SEA

"Coming Topside"

The Navy's new swept-wing, twin-jet FTF-2 fighter, designed to be a top performance member of America's Air Power team, comes up on the deck-side elevator to the flight deck for carrier evaluation trials.



Chance Vought Aircraft

BALTIMORE, TEXAS

ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION

AVIATION WEEK

Pentagon in Upset, Warns . . .

New Air Power Plan Would Scuttle SAC

- Administration favors fighters over bombers.
- Also wants cut back on second-source output.

The Pentagon settled last week with basic conflicts over the future of military aircraft production.

Defense Secretary Charles E. Wilson, storm center of the current military aircraft dispute, attempted to lower an iron curtain of secrecy over the Pentagon's final decision on second-source aircraft production, marking "unprecedented disclosure," news of the following major battles snuck out of the Pentagon.

Conflict between Wilson and the Air Force over future USAF policy, Wilson would like to slash jet bomber production, thereby and concentrate on fighters and defensive missiles to bolster air defense of North America against threat of Russian missile attacks. USAF is bitterly resisting what it terms "a Maginot Line" concept of air defense and were that neglect of its jet bomber striking force would be causing national disaster.

• Conflict of Wilson's Defense automobile manufacturing philosophy of defense production and the industrial auto-industry program backed by the auto. Ford, Navy and other auto industry. Wilson wants to reverse the industrial auto-industry policies established during the Defense Department's reign of George Marshall and Robert Lovett in favor of increasing the military industrial base, encouraging foreign and second-source production and scrapping surplus plants and reserve tooling. Wilson wants primary auto-industry assistance on quick conversion of civilian plants to military products.

Military and aircraft industry production experts point out that this "Defense auto-industry" was given filliation by the bitter experience of World War II and the present Korean emergency when it took at least two years to convert auto plants to military products or establish new military production facilities.

• Conflict between the Republican economy bloc in Congress that favors immediate drastic defense budget cuts



RECENT VISITS such as this to Boeing Wichita B-47 Stratofortress plant by Defense Secretary Charles E. Wilson (center, dark suit), USAF Secretary Harold E. Talbott (right) and USAF Vice Chief of Staff Gen. Nathan F. Twining (second from left) preceded disclosure of Administration plan to make heavy cuts in bomber programs.

and a coalition of big business congressional leaders and military brass opposed to waste reductions in military production and armed strength. The congressional leaders overruled Wilson's proposal to reverse the industrial auto-industry policies established during the Defense Department's reign of George Marshall and Robert Lovett in favor of increasing the military industrial base, encouraging foreign and second-source production and scrapping surplus plants and reserve tooling. Wilson wants primary auto-industry assistance on quick conversion of civilian plants to military products.

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• Capital. View—Washington reaction to portions of the defense debate leaked across the Potomac ranged from opinion that "Wilson is a worse Defense Secretary than Louis Johnson" to a feeling that the Republican regime eventually will emerge with a militarily sound and economically feasible defense program.

McG-15 Seap

A trained observer who saw the first test flight McG-15 to scrubbed loads in Western Europe has disclosed an important feature for AVIATION WEEK readers. Turn to pages 17, 18 and 19 for description and drawings.

Some observers believe that the Wig-wag aircraft is the best value an administration since 1950 has offered above the Capitol and FBI regardless of the end effect on the armed forces or an actual waste of funds in programs already too far advanced to offer a chance for real economy. Other observers believe the Pentagon budget process is a selection, orderly process proceeding along the broad lines of the Campbell Report (AVIATION WEEK, July 10, p. 12).

Although USAF Secretary Harold Talbott has made no public statement on his view in the current debate, indications are that he is backing Wilson's position against that of USAF military leadership.

Talbott recently concluded with Strategic Air Command Gen. General Curtis LeMay at Orlando and Air Materiel Command base at Dayton on the proposed cuts in jet bomber production. He visited key SAC bases at Carswell AFB, Texas, where the bulk of the B-52 strategic bombers are kept and MacDill AFB, Fla., where the first B-52 wings are operating.

Local Gen. Oval Cook, Deputy



American progress in aviation
is respected
wherever the compass points

America's advancements in the world of aeronautics have built an enviable reputation that reaches to the four corners of the earth.

A prime factor in building this global reputation has been persistent research for better materials . . . better fabrication . . . and better production methods.

To Progress through Research is a constant in Rheem development and manufacturing. Our facilities are available.

RHEEM—Aircraft Division, Downey, California . . . Research and Development, Whittier, California



JET FIGHTERS: the heavy B-52 (above) and medium B-47, with searchlight spotlight



SPEEDY INTERCEPTORS: the Convair F-102 (center's aircraft) under Wilson plan

Chief of Staff for Procurement, and the newly appointed Assistant Air Secretary for Materiel Roger Lewis were in Dayton last week reviewing USAF's production acceleration programs, procurement and target budgets of Wilson's administration.

► **Special Mission**—USAF finally can end its budget presentation to Defense Undersecretary Roger Kies and other key men on Wilson's list that will include Kies and USAF Undersecretary James Douglass Jr. for special briefing by General LeMay on the jet bomber program. The Kies-Douglass mission was interpreted as another effort by USAF to convince the Wilson regime that the jet bomber programs in a vital part of the U.S. defense program.

Origin of Wilson's opposition to the USAF jet bomber program is not clear, but it results at least in some if not profit from the Project Leader report, as the defense chief does by Massachusetts Institute of Technology under USAF contract (AVIATION Week Mar. 23, p. 13).

Some observers believe his views also are influenced by the fact fighter aircraft cost much less expensive than jet bombers and a better expected showing of economy can be made by eliminating expensive bomber programs.

If the ruling against USAF's jet bomber program stands, it probably will involve eliminating the B-47 program, new underway at Lockheed's Marietta

plant and the Douglas Tulsa Division. Total B-47 programs would not be about 400 planes. Remaining B-47 production would be concentrated at Boeing's Wichita plant. A large network of subcontractors is expected to support the Marietta and Tulsa programs, which would also be concentrated under the proposed program.

► **Refurb Woolrich Decision**—Boeing's B-52 Stratofortress program also would be reduced in little more than a year to about 400 planes, probably fewer than 200 aircraft from the major B-52 prime contractor now scheduled for the Strategic program.

Although Wilson's primary intent as an defense man result from the lower cost of fighter aircraft, the Project Leader study estimates the cost of an adequate production of 120 jet defense aircraft at \$1.5 and \$2.0 billion.

Wilson's decision also would a sizable diversion of the three Army Corps of Engineers from their more expensive Boeing B-57 Flying Fortress. This decision was made with declining the B-17 development program by several years in the critical period just before World War II.

Wilson outlined his industrial goals with boldness in a speech "off the record" luncheon for Pentagon reporters that quickly became a matter of record. His views are based on the idea that a relatively small aircraft industry operating at high production rates is

more efficient than a larger industry composed of several smaller and less-costly producing at lower rates.

Pentagon planners don't question that Wilson's plan is a more economical way to meet current production requirements but they point out that first two or three generations have proved that it is not the answer to avoid the problems posed by a major war or military strategic war survival.

► **Enviro Study**—Wilson's plan to meet a full-scale emergency is based on the same concepts of automotive factories to war production. But Pentagon planners point out that it has been nearly three years since the first auto mobile makers had begun to build automobile engines under license from the aircraft industry and that these automobile firms license were still one of the slowest units in the current production pattern.

Wilson also proposes to reverse the Marshall-Lovett policy against weaponizing principles of weapons with a fast rate of obsolescence. The Marshall-Lovett policy forced existing production capacity rather than "explosive" stockpiles. Wilson proposes to solve wartime obsolescence problems by stockpiling basic aircraft and other equipment the way was done World War II equipment and kept in storage during the Korean war. Again Pentagon military planners point out that, how ever conveniently otherwise this policy might be, it is extremely disruptive militarily since it would require our armed forces to wage obsolete equipment.

If the Wilson philosophy prevails the following production program now scheduled for a second year will be restricted to the present manufacturing: Convair F-102, about 100 aircraft; Convair F-106, about 100 aircraft; McDonnell F-4H, long-range jet fighter.

► **B-52 B-106 Trainer**—Convair aircraft has been designated a second aircraft for the program.

The current aircraft carrier production pattern is classified as a combination of Wilson's semi-annual philosophy, some revision of jet engine types or quantities, and the halting production of auxiliary aircrafts. For one reason or another the following engine production rates are slated for reduction in addition to the General Electric J77-25 program (AVIATION Week Apr. 6 p. 15).

► **Wright R3350 Turbo-Compound engine**—Lockheed's Chamber of Transportation, N. Y., will take the lead of that in direction.

► **Wright J67 Supersonic Transport**—Lockheed's program will be canceled.

► **Wright J65 Supersonic Transport**—Lockheed's program will be canceled.

► **Worthington J40 subjet**—Lockheed's Lockheed-Marietta De mises will be docked out of the program and Worthington

hour's own production schedule has been reduced and stretched out.

► **General Electric J73 turboprop**—Major setback on this engine is primarily the result of reduced engine requirements.

The battle on Capitol Hill over whether the current Bascom plan of defense warmth is more defense value will be fought in a place of politics while the fighting now goes on behind the Pentagon curtain of secrecy.

The Republicans' budget plan is

expected to propose a defense cut of 55 billion. Opposition to Bascom's Bascom and Republicans will be based on skepticism as to the real cost of the Bascom cuts and the advantage of hard-hitting military programs over the rest of defense spending were destroyed in October just after the now-useful United Nations' findings at Geneva and elsewhere that reached the Yale Rover and the congressional panel of December when the Chinese Communists attacked in full force and Congress was willing to give the Pentagon a blank check.

Congressional leaders such as Sen. Leverett Saltonstall, a Republican, and Sen. Lyndon Johnson and W. Stirt Stromberg, Democrats, are warning that an adequate defense production program and national military policy cannot be maintained without adequate long-term military planning and striking to these plans.

CAA Orders Fix

On H-S Prop Assembly

Another in a series of aerobatic propeller aircraft workload the transport plane industry was opened in the pilot of an Air Force's Fairchild C-119 Packet at Greenville, S. C.

As a result of the accident, Civil Aeronautics Administration has issued an enforcement directive for these Fairchild Standard transports per planes incorporating low pitch propeller blades which have wider ribs spring. These are used in the following planes: Boeing 377, Convair 240 and 340, Douglas DC-6 series, Lockheed Constellation series, and Martin 2-2 and 4-4. The Fairchild aerobatic propeller models 23360, 24160, 43860, 4421, and 4421.

The directive states that the wind tunnel model tested while the Packet was making an approach at Greenville Airport May 16 and was caused by "propeller scaling of the surface on the low pitch propeller." This resulted from "an accumulation of turbulence in the low pitch propeller airfoil." The new aircraft would be accomplished by elimination of new aircraft construction and an navigation facilities, a sharp cut in air navigation development, and moderate cuts down the line.

It would involve dismissal of 391 CAA employees. Employment at the current year is 17,225. Under the enforcement budget, this would go down to 13,881. Under the Truman proposed budget, employment would climb to 17,337.

Breakdown of the \$14,947,000 CAA appropriation recommended by the new Administration:

► **Airport construction**, \$12,706,000 in largely contracts already signed. Truman budget recommended \$10,230,000 for contract liquidation, plus \$18,000.

► **Establishment of an navigation facility**, \$7,000,000 to liquidate contracts. Democratic budget proposed an equal amount plus \$15,000,000 for new facilities.

► **Air navigation development**, \$1,750,000. Budget has recommended \$6,000,000.

► **Science and expenses**, \$500,500,000. Budget called for \$10,300,000.

► **Establishment of an navigation facility**, \$7,000,000 to liquidate contracts. Democratic budget proposed an equal amount plus \$15,000,000 for new facilities.

► **Air navigation development**, \$1,750,000. Budget has recommended \$6,000,000.

► **Science and expenses**, \$500,500,000. Budget called for \$10,300,000.

At the now-scheduled event at 10 a.m. to introduce its proposed legislation, reporting of all low pitch propeller blades is desired. This is accomplished by breaking the easy from the wedge surface surface of the leaf with a portable grinder or metal grinding machine and following drawings in Fairchild Standard Service Bulletin 249 issued May 26.

65% Cut in NACA

Construction Funds

The Johnson Administration wants \$10 billion cut from the \$34.6 billion recommended by the Truman budget for construction of new National Aerospace Committee for Aerospace facilities in fiscal 1954.

The two-fold reduction would be accomplished by eliminating:

► **A rocket engine research facility** at Cape Canaveral, Florida, \$1,750,000.

► **Variable Mach number nozzle for a high- M engine** research facility at Langley Laboratory, \$1,750,000.

► **Test section** alternative of supersonic free flight tunnel at the Ames Laboratory, \$1,750,000.

The new Administration also cuts reduction of the Truman budget of \$55,000 for NACA administrative expenses over the coming fiscal year to \$57,000. This would still allow NACA to hire 230 more employees. Current NACA employment level is 7,220. It would total 7,450 under the Johnson budget (under Truman's \$1,000).

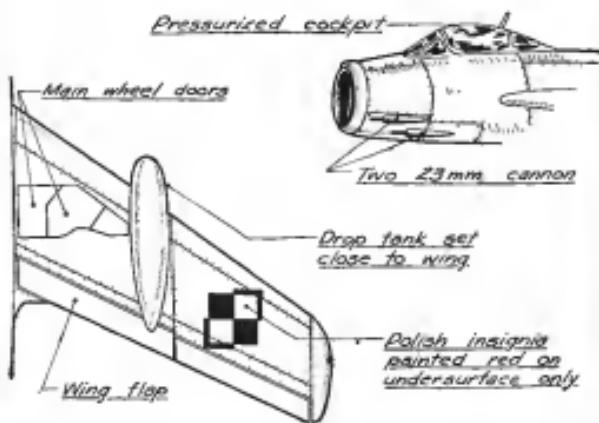
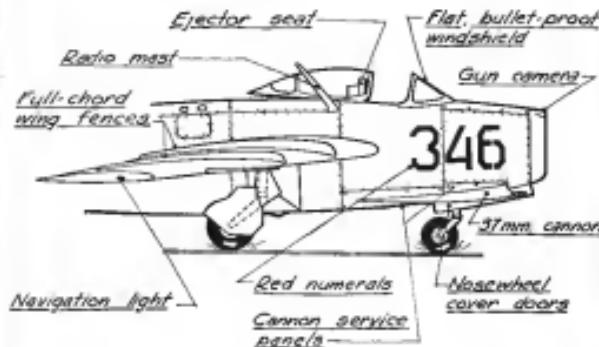


NEW ITALIAN COPTER TESTED

Initial flight trials have been made at Olbia Airport of the two-place on-rod helicopter built by Count Ettore Moneta and named the Dragonfly. Engine is a 109 hp, air-cooled type without exhaust nozzle to aid cooling. Gross weight of the Dragonfly is 1,024 lbs. Top speed is approximately 75 mph. Rotor diameter is 26 ft.

OBSERVERS NOTEBOOK

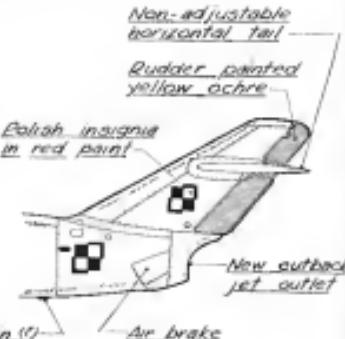
FUGITIVE MIG-15 AT RÖNNE



Navigation light
Mass balances



Fixed trim tab
Air brake shown in open position



MiG-15

Three-view drawn from measurements of 89ne



ALPA Sets Jet Liner Standards

What kind of jet-powered transport do pilots want?

Last week Air Line Pilots Assn. (ALPA) put together the operational knowledge of 15,000 flying men and women and wrote up with them first answers to the question.

Here are some performance standards, presented by ALPA's engineering staff:

- Stall speed should be limited, until considerable practical operating experience has been gained, to around 90 mph. For a 5,000-lb. runway, at 97 mph for a 7,000-lb. aircraft, at 1000 ft. level, maximum landing gear weight condition.

- Basic factors already affecting performance—airplane temperature, humidity, pilot technique, service above, and power low—should be included in designing jet transports before they are being considered in new Civil Aeronautics Administration regulatory performance requirements now being formulated.

- Maintenance turbine transports (approximately 1,750 m. range) and jet transports should be capable of operating in excess of U. S. runways in the 5,000- to 6,000-ft. category.

- Long-range jet liners (2,000 to 3,000 m.) should be able to operate on 7,000 to 8,000 ft. runways.

- Speed-reducing devices such as drogues should be capable of operating at a speed sufficiently above the critical Mach number of the airplane to assure negative control of the aircraft and designed for use in an emergency derived from maximum cruise altitude to about 20,000 ft. in two minutes in event of loss of pressurization.

- Non-booster control is desirable, but a boost system is used, response and roll should be similar to that of large transports with fly-by-wire. Airplanes should be capable of maneuvering and landing without the boost system.

- Stability and directional control should be built into transports to ease the pilot's job of maintaining proper field attitude, at least pending further autopilot refinements.

- Control through stick should be designed into the airplane, with good control or slightly above stick neutral.
- Ground deactivation method in addition to wheel brakes should be provided, permissible drag chutes or reverse thrust devices (ALPA points out that no engine equipped with a reverse-pitch propeller has had an "over-shoot" accident).

Highlights of ALPA structure proposals:

- Fatigue study should receive greater consideration.
- Coordination between structures and

engines during landing stage should focus attention on vital locations for service doors and inspection plates, making that doors may open and close during flight.

- Leading edge should be designed for rugged use and for relatively easy replacement.

- Pre-flight powerplants and landing gear insulation should be designed to break off with minimum damage to fuel lines, oil lines, tanks, wings, etc., in event of emergency landing.

- Turbulence encountered in high altitude flight should be analyzed to ensure structural integrity of the airplane to withstand gear loads.

- Fire Protection—Alternative proposals suggest making baggage compartment accessible to fire fighting in flight or to make a firecall around the baggage compartment that will confuse a thief without endangering servicing structure.

- Equipment and accessories under the floor should be accessible to the crew in flight. ALPA says, and use of non-inflammable hydraulic fluid should be encouraged. Heat-resistant materials are recommended to reduce fire in an engine or generator location area. Location of shutoff valves for liquid oxygen, if feasible, should be enough off the engine so that no need damage in a crash site is used.

- Emergency—Heat emergency equipment will prevent survival of every other passenger in alternate proposals. A self-igniting search light also is asked.

- Anti-washout of present transports should be a minimum. ALPA says.

- Design of seat cushions so double in life pressure is recommended, with internal location and manual operation of belt seat belts.

- Crash—Crash survival fuel tank, designed in bell form, along with underwing fueling. Fuel storage is proposed as far outboard of the engine as possible, with preference to wingtip. Fuel tanks even at the cost of a slight sacrifice in speed.

- Propellant insulation is recommended to limit fire in the nozzle so it will not be possible for the fire to damage the airplane structure, affect other operating systems, or prevent an engine to stop.

- Special insulation is called to the National Advisory Committee for Aeronautics' recommendations for meeting temperature criteria after a crash.

- Deicing—In recommendations for deicing equipment and cabin heating, the pilots prefer exhaust heat exchanges

as free of a fire hazard for wing deicing than gasoline heaters. But if gasoline heaters are installed, pilots say they should be located in the fuselage and accessible to the flight crew.

ALPA also urges reliable windshield deicing, wing lights to detect ice formation and selection of metals made on a basis of withstand tests for effects of ice accretion.

Other recommendations were:

- High-speed extraction of landing gear, use of dual tires on one side with one tire supporting the plane's weight, emergency fuel-off and locking of landing gear and doors to prevent unwanted extraction on the ground.
- Incorporation of gear and flap to minimize chance of a wheelbarrow landing.

- Independent air conditioning system for flight crew compartment with separate temperature controls.

- Electro fuel selector valves and tank ties are proposed by the pilots, who favor centralized operation.

- Shoulder harness. In case, including flight attributes, with suitable structure should be mandatory.

An introduction urges that jet designers and operators personnel give consideration to reports of the Pilots and Distiller Committees and the National Air Transport Coordinating Committee's study of operating problems.

The material was compiled by Ted Lerner and Carl Eick of the ALPA engineering staff, with the impersonation of ALPA president Clarence N. Ryan and 21 airline pilots from American, Pan American, United, TWA, Eastern, Capital, Pan Am, and other airlines.

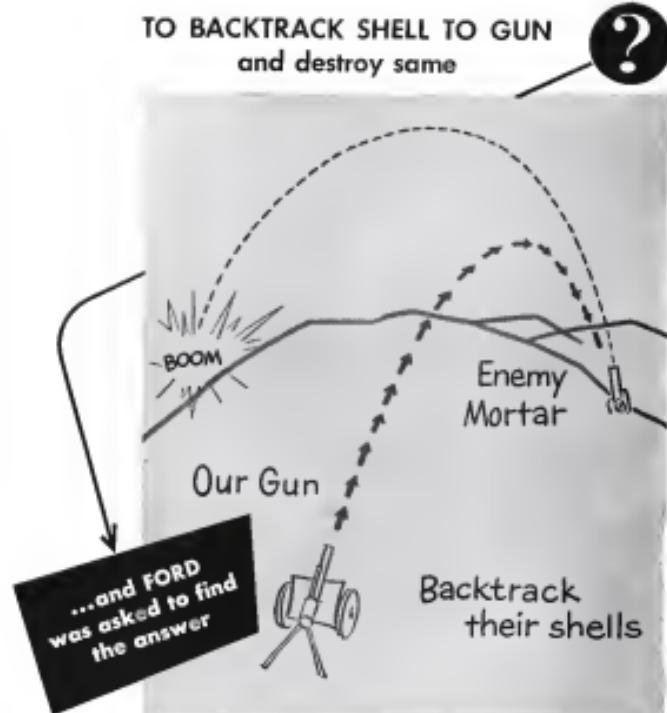
AA's 1952 Revenues Top \$187 Million

American Airlines last year recorded revenues of \$367,544,000, lagging in sales and market share a net income of \$12,214,000 compared with 1951's \$16,071,000 revenue and net of \$16,549,000.

The big U. S. carrier last year flew 5,094,000 passengers or 24.75% of the total domestic transline traffic. A large gain was made in seatload, last year the total came to 17% of the carrier's total traffic compared with 7% for the previous year. AA saw annual revenue during 1952 being approximately double that of 1951. American's freight and express flight tonnage in 1952 total 360,000 revenue last year.

At the end of 1952 the carrier had line contracts for 364 million in new aircraft and related equipment and another 55 million authorized but not yet committed. Deposits totaling \$13.4 million had already been placed with manufacturers.

TO BACKTRACK SHELL TO GUN and destroy same



On problem he "knew" approaching and flew back-tracked to locate the source or gear that fired them? This problem was simply resolved with special computing equipment designed to be built right into the gun. The engineering of such a computer, the handling of such ballistic data, all falls into the pattern of previous Ford achievements.

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LORD Flexible Couplings
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OF BOEING TURBINE ENGINES



HERE again you see at a glance Lord versatility in designing bonded-rubber components for a wide diversity of machines. The photo at top right shows the Boeing Gas Turbine-Driven Truck-Trailer for heavy cargo hauling. At the top left you see a United States Navy personnel boat driven by the Boeing Gas Turbine Engine. Directly beneath it the Kaman Helicopter powered by the Boeing Gas Turbine Engine. Details are clear in the foreground. The Lord Bonded Rubber Flexible Coupling designed for the job transmits the power in each machine.

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Headquarters for
VIBRATION CONTROL

about 47% of the items reviewed, even those where the British felt there were complete agreements but where the CAA felt more evidence was needed. On May 19, the additional evidence of good facts in Class II couplings was forwarded from ARI to CAA.

• **Class III** couplings covered the points of disagreement. But by then, there follows the first official list of these points.

• There were four points of concern: size covering silicon poly, temperature acceptability, shock and leading distance that CAA insisted should be figured on the basis of starting speed squared. The British have opposed this standard for many years in negotiations over piston types. At the ongoing International Civil Aviation Organization meeting in Paris in May, the British have been told, the U.S. officially will abandon this standard, adopting instead a basis for requirements on these points in line with British methods. There is, in fact, an ARI official in Washington now helping CAA convert its requirements on a basis other than starting speed squared.

• CAA specified special shapes for certain loads on the except panel. The British advised fully to employ. They were surprised to find that no U.S. aircraft complies with this requirement.

Airframe Committee

• CAA and the U.S. must be specifically reminded that the panel can load with 100% more content out of an aircraft. The British claim this can't be done in a jet, that is, they can't prove a different conclusion. The CAA, with two completely independent hydraulic systems from tank to tail, is already fully load alleviated, the British say.

• The U.S. aeronautics agency insists on double panel to withstands and withstands on jet operating at 40,000 feet. The British argued that two panels are no better than one, sufficiently stressed. Nobody denies that explosive decompression at 40,000 feet would be fatal. ARB says, but it shouldn't happen any other than a wing falling off. The British board claims the Concorde 3 windows have been tested to better than 150 ps and that the pressure differential of 40,000 ft is 15 ps. And the British start with a safety margin of 10 or 12 ps per seat.

• The British, however, do not believe the Concorde 3 windows are safe. Concorde 3 was intended to look. This safety design change saves no less than 500 lb structure weight in the Concorde 3. Two pairs of glass could be put on, but to conform with the weight-saving design, the disagree-



Boeing 747 is one of the giant aircraft destined by the U.S. to the airline industry. It is similar to the Airplane Passenger Division.



SKIN FOR A FLYING BANANA

Aircraft helicopters, the 14 to 20 place, tandem-rotored Piasecki H-21—known as the "Werk Horse"—has a greater load-carrying capacity than any other helicopter in U.S. military service.

For this ship, Goodyear Aircraft Corporation builds the complete fuselage shell and supplies brakes and both Placeo and bullet-sealing fuel tanks.

In 1950, Goodyear Aircraft teamed with Piasecki for the engineering of the original "Werk Horse" fuselage—applied its manufacturing experience and ability in various fields to save weight and solve

many of the problems attendant to the design of this futuristic rescue and utility transport.

This engineering and production is typical of the teamwork being done by Goodyear Aircraft Corporation for practically every member of the aviation industry. Whether the job is one of building components, air frames or complete aircraft—Goodyear stands out as America's most versatile aircraft manufacturer.

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Follow a brief résumé of your qualifications and experience, or write today for an application blank and further information. Address: De K. Brown, Vice President of Engineering, Goodyear Aircraft Corporation, Akron 15, Ohio.



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What JACK & HEINTZ is doing about...



Tomorrow's higher speeds and altitudes create aircraft and necessary cooling problems—at Mach 3, inlet air temperatures rise about 700°F., skin temperatures 600°F.

This means entirely new concepts in aircraft engineering design and development.

The Thermal Barrier, encountered by planes flying in the stratosphere at supersonic speeds, offers a perplexing problem. The temperatures outside the plane range down to a frigid -67°F. Yet the air from the outside conducted into the plane's electrical equipment, for cooling purposes, is hundreds of degrees too hot to be effective—as the result of pressure and friction created by the plane's terrific speed through the rarefied air.

On military aircraft designed to operate at speeds of more than 2,000 mph and at altitudes approaching 100,000 feet, the attainment of adequate cooling and trouble-free commutation of rotating electrical equipment will become increasingly difficult.

To meet the trend toward ever increasing speeds and altitudes, Jack & Heintz engineers are continuing to develop new higher altitude, higher speed equipment. Some of this is completely environmental-free.

For example, we have a group of new,

the THERMAL BARRIER

high-altitude motor generators, designed with improved insulation, larger commutators and staggered brushes resulting in reduced brush temperatures and greater air flow over the commutator. Our new FB3-1 Control is used for the first time on these motor generators. Simplified to extremely close voltage and frequency control is obtained with this FB3-4, a unit performing functions formerly requiring two controls.

For aircraft generator requirements, we have developed environmental-line units completely independent of altitude or speed and incorporating new concepts in the cooling of electrical equipment.

J&H Model G75 a-c generator is the first in the industry to incorporate a cooling system utilizing the evaporation of water.

Another generator, our Model G37, is cooled with a chemical coolant, circulating in a closed recirculating system. J&H Model G38, while still a liquid-cooled unit, can be considered environmental-free, since it incorporates a cooling method utilizing bleed air from the pressurized cabin.

NEW IMPROVED COOLING METHODS INCORPORATED ON J&H EQUIPMENT



Top: G75, G37 Rotomotive,
G38 Generator



G38 Model G37 Motor Generator

J&H looks to the Future

To the designer of electrical necessities, higher speed and altitude requirements pose new problems. But, with a morally completed altitude chamber, engineers at Jack & Heintz can now determine in advance of flight test how their equipment will behave at the super-sophisticated altitudes of the future. Designed and built by J&H personnel, the altitude chamber will permit complete Air Force qualification tests, duplicating the temperature, air flow, atmosphere pressure and humidity char-

acteristics of altitudes up to 100,000 feet. Although the chamber has been basically designed to test aircraft-orienting machinery, it is readily adaptable for testing mechanical, pneumatic, hydraulic or other types of aircraft accessories.

You can possibly draw on the design and development expenses of Jack & Heintz in helping to solve the high-speed, high-altitude problems we are all facing. Write Jack & Heintz, Inc., Department 605, Cleveland 4, Ohio.

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in Kansas City, CAA Administrator Lee brought out a few more general points of disagreement. One important one: The threat of jet impact under static conditions is very low compared with torque. Also, there is no dip stream over the wing in a jet plane. For these reasons, the takeoff accident rate is low and the early claims of the accident rate is low.

In the case of the Comet, as was already shown in the two Comet crashes, the engine will not build up speed on takeoff when the tail is down. In this situation, the deceleration drag of the big wing and large flap is too much for the powerplant. As a result of the Kansai crash of a Canadian Pacific Airlines' Comet on Mar. 7, steps are being taken to correct this—probably by installing a stall warning indicator in the tail, either a tail bumper or tail probe.

But in normal conditions, the Hawker class, "tail-on" acceleration of a jet aircraft is no worse than that of a propeller plane, according to the engine manufacturer, who says, "It's about the same as a propeller plane." Let's also add more points to make of the landing characteristics of jet aircraft. "The chance of propeller and aircraft hitting," he said, "plus high approach speeds and close approach conditions, are basic to make stopping very difficult on runways of moderate length." We feel that civil jet aircrafts should be designed to use existing runways.

There are 1,200 new jet aircraft flying in the jet, although experiments are going on both in Britain and the U.S. But D.H. says, "The Series 3 Comet, under standard conditions, re-



TARGET MARKERS

These leaded landing markers mounted under the wing of a North American T-6 Texan quite often eliminated vehicles which often made short takeoff and landing Communist targets for specific UN fighter-bombers. The slow T-6s made the North Korean battlefield spotting targets hard to see from a fast moving jet. This plane belongs to the Fifth Air Force's 62d TFS, 1st TFW, Control Group.

AVIATION WEEK, April 15, 1962

RADIOGRAPHY prevents waste



Radiograph of an iron casting
for a reciprocating arm.

when a \$2 casting gets a \$375 treatment

This is a casting for a reciprocating arm. It is to be machined and hand scraped to a flatness of less than .0001 inch. Should porosity show up during machining, the cost of work done and heat treatment is wasted. The part must be scrapped, not scraped.

But radiography avoids that. By x-raying every casting, flaws are discovered before work is started . . . before hundreds of dollars have been invested in machining and heat-treating costs.

This is another example of the savings possible through radiography.

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ANGLowers are described fully in the I.A.S. Aeronautical Engineering Catalog. We suggest you refer to this publication for complete data.

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goes on 6,000 feet of runway to clear an obstacle 10 feet high at the end of the runway with one engine driving at the critical point—and that with its maximum gross weight. Aside from

the fact that Series 1 Comets are certificated for military minimums, Series 2 Comets will be equipped with Marquette brakes which can bring the aircraft to a stop in 410 yards.

CAA Ready to Talk With ARB

By Alexander McSorley

Civil Aeronautics Administration wants to negotiate with the British Air Registration Board in early confirmation of the Comets 3 in the American World Airways' use, CAA administration-delegate Paul B. Lee has told Airways Weekly, but there are definite safety responsibilities involved which cannot be entirely bypassed.

Lee said CAA's Technical Committee on Jet Transport Requirements should really go over to Great Britain when enroute from August to September, if the ARB was ready to receive talk on the subject.

Lee said my information that CAA was making technical problems to cause unnecessary delay for political reasons is entirely unfounded and that the government could voice one that properly should be handled on a technical, not a political, level.

► **West Coast.** Tom CAA's working group, headed by George W. Haldeman, has just completed a tour of the principal U. S. transport manufacturers on the West Coast to check out industry criticism of CAA's 1973 Statement of Policies for Turbine Transport Certification. The committee also visited the USAF Directorate of Flight Safety Research at Wright AFB, Calif., to make a study of data available on military jet accidents.

During the committee's report, the industry discussions had to substantiate the validity of the 1973 statement. (See details of statement in *Airways Weekly* Mar. 2, p. 36.)

CAA's position in the recent Washington discussions with the ARB was largely based on this statement of policy.

► **On the Boeing.** "At every session," Haldeman, chairman of the committee, said, "we were told that we were in the right track, generally speaking. Of course there were some things which we had questioned and that all the manufacturers had not yet investigated, but one engineer told us that we were 95% on the basis. And there was very little specific criticism."

One valid criticism raised, Haldeman said, was that the CAA turbine transport policies include safety problems not exclusive to jet transports but common to all high-speed aircraft of high altitude.

However, this criticism probably will be met by changing the title of the

statement of policy, after thus raising the not exclusively jet problems. ► **Policy Justified.** Haldeman said there is ample justification in observed USAF accident reports of jet engine cargo compartment failures for CAA's proposed requirement for jet engines to be positioned in such a way as not to cause a major structural failure of the airplane, if something lets go.

CAA has not taken a firm position by insisting on double-pane windows or on outward opening doors of pressurized cabin, despite British statements to this effect, Haldeman said.

As Van Neys, Gold, Haldeman, was checked out in a T-33 jet trainer as a part of the committee's familiarization program with jet. He also flew as observer in an F-100 Starfighter jet fighter fighter.

► **Drag Blue.** One thing that kept the committee members in that CAA has over-emphasized the problem of a pilot flying a jet transport much more than some differences. The drag you encounter in a plane approaches the speed of sound is such that Haldeman believes it would be virtually impossible for a pilot unknowingly to get into the sonic region in level flight.

► **Phase I Review.** The committee finished.

► **Boeing.** The CAA jet committee is newest development work on the proposed DC-8 as transport and also has been responsible work on the KC-135.

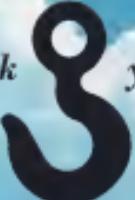
► **Lockheed.** They discussed Lockheed's proposal for the new 375-2 turboprop. Configuration is far from a stopgap. Configuration is far from a stopgap.

► **North American Aviation.** They reviewed the ground jet transport picture with a design group which North American has set up to keep current on jet transport design problems.

► **Seattle.** They discussed details of the new four-jet supersonic transport which Boeing expects to have flying sometime in 1974.

► **Convair.** The committee discussed jet and turboprop design generally.

Following a short period to digest the information compiled from the industry visits, the CAA jet committee will begin to visit airports around the nation, the NASA laboratories for further investigation of problems affecting the jet transports. The purpose of the work is to be completed in June when a report summarizing the committee's findings will be prepared.

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SPECIAL NEWSLETTER

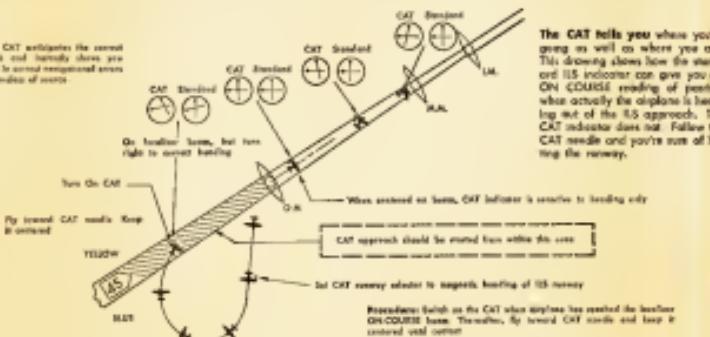
Of vital interest to online management, this newsletter describes the latest, simplest answer to the problem of precision B&B approach: the new **Wilcoxi CAT (Computing Autonomic Tracker)**

Stay the GAT! It's well known that a common fault of the IBS approach system is the problem of continuing the approach once the airplane has strayed off course...either because of turbulence, cross-wind or pilot's attention being diverted. If this happens during the latter phase of the approach, the pilot may find it impossible to regain proper alignment.

The GAT tells him when he's off course, when and how much to turn to get back on. It obtains heading and position information from the stabilized compass and localizer receiver equipment and computes a steering course signal for the pilot to follow.

Possible for pilot to pay for himself in just a few missed approaches. The CAT eliminates false bracketing at most critical part of the landing. It eliminates chance of airplane being displaced from a safe landing position and missing the ILS approach. The CAT directly represents a beam that is actually a break to the runway.

CNT mitigates the current and future challenges presented by the current organizational structure of society.



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scheduled service by Eastern Air Lines.

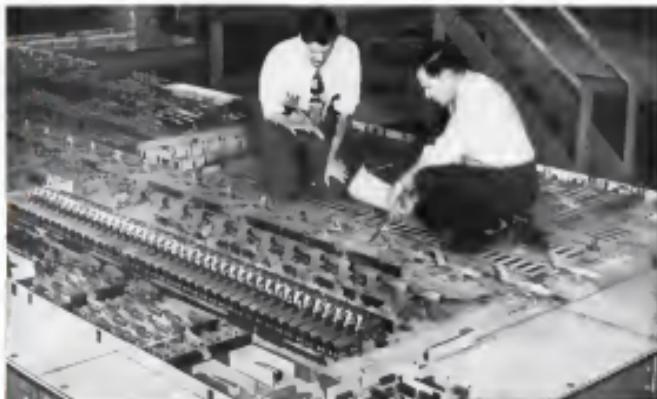
The CAT next gen aircraft present instrumentation. The basic flight instrument group is unchanged. No loss of scheduled flight time—only a few man hours required for installation. Accuracy of CAT Indicator can be constantly checked against Standard ILS. A failure warning system insures safety.

Here's the biggest: The total cost of the amazing new Wilson CAT unit, F.O.B., Kansas City, Mo., is only \$450,001.

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PLANT LAYOUT search, working with E2E models, are unique. The Associate process turned to more advanced planning when

Republic Finds Way to Beat Engineer Shortage

Break It Down, Make Things Simple

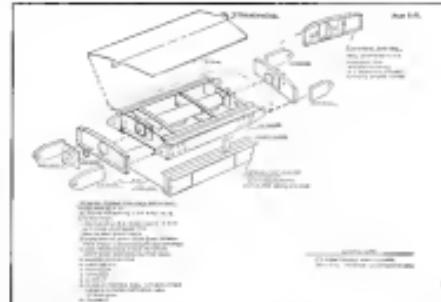
- Skilled group writes the planning layout sheet
- Relatively 'green' members can take it from there

By Irving Stone

The continuing shortage of trained technical personnel has forced Regulators and Analytic Groups to initiate their own training and work simplification programs.

Under the work simplification program, top Republic engineers have created a system of planning layout sheets that allows a relatively inexpensive newcomer to turn out detail operations by complicated jet aircraft.

Skeleton Force-Bæk in 1938, a public, but often unfulfilled, demand in the aviation industry began to feel the sharp pinch of engineering talent scarcity. Along with demands of pilot instructors, crew shops which were not aviation began to sense the enormous



DETAILED OPERATION SHEET is prepared from planning layout. Normally this document would have to be prepared from more or less of detail on engineering drawing—not in any job for a man with limited experience in aircraft manufacturing procedures.

Speaking of BENDING



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ing potential for subcontract work and to hire engineers and related talent.

At Republe we saw the situation, one sees where a great need was going to exist in manufacturing—simply because mass production of a jet plane is considerably tougher job than was the construction of all World War II aircraft.

The company knew it was going to produce the F-84, the F-84F and the RF-84F, a big job was ahead.

Biggest problem was the development of a Manufacturing Methods set-up from a scratch. Once a minimum group which processes aircraft engineers changes—so an organization able to produce aircraft projects by production methods.

The F-84, the RF-84F, the aircraft completely new design. When these projects landed, the working force remained of only about 55 men.

Too Many Details—The methods engineer gets the complex engineering drawing and determines the basic plan for building the airplane.

Republe's engineering force of 15 engineers in Manufacturing Methods was experienced in the overall aspects of aircraft fabrication. They were settled with the basic basic planning the aircraft building scheme, determining the major job points, defining the master, assembly and subcontractor tooling, writing assembly operation sheets, and finally carrying it down to the actual procedure for producing the final product.

It was soon realized that the existing methods were not good enough, and the need arose with the F-84F and RF-84F projects. For this reason, a clearly laid, experienced team, the basis of total prescribed effective liaison with other departments—Plant Layout and Equipment, Time Study and the Production Shop.

It resulted in their not being able to go ahead in implementation of the plans then associated with the new projects. These departments could find to eliminate the problems and offer recommendations for change based on their experience.

Activity Split—It was decided to segregate the Manufacturing Methods section into two departments—Methods Planning and Processing—and expand the force. Actually that change took place in the middle of the F-84F project.

• Processing would handle detail operation sheet and tool orders.

• Methods took over all the other functions of the particular consolidated department. In addition, it handled all contacts with design activities, gave technical assistance to subcontractors, effected liaison with other company departments.

The greatest need was to get men

for the Processing department. Experienced personnel were almost impossible to come by, so Republe had to do the next best thing—招 men with previous experience and train them to fit into the manufacturing scheme.

Thus was set to get men with engineering degrees—far out of school, with no aviation experience. While solicitude found only a few of these.

To get the best basic engineering design level, Republe screened others, looked closely at their background of work in industry and their schooling availability base, too, was weighty.

► **Planning Layouts Devised**—It was assumed that men with good, basic backgrounds, graduate training, would best assist. This help to Republe "picked the bones" of an experienced engineer in Methods Planning to devise a means for simplifying the job.

Methods planning with a series of planning layout sheets to show just how the airplane would be built—a complete breakdown process.

The planning layout sheet arranged in a protective structure of the part to be manufactured, with a description of the tools and operations required to accomplish a particular assembly.

These one-sheet, one-and-a-half-page sheets were the concrete translation of the expanded drafting of a small group in guide the inexperienced assemblies by giving them a thorough job analysis in a form that could be digested without great effort. The sheet illustrated for the new case, the mechanical means of gaging for work base to do in meeting the engineering drawings and the finished components.

From the planning layout, detail operation sheet writing becomes more or less a routine task.

Previously, the operation sheets had to be developed directly from the expanded drawings. This is a formidable procedure for a small production rate with experienced personnel, but a tremendous job with both plane complexity and inexperienced help.

Coupled in one volume, the planning layout sheet becomes a handbook book of the complete airplane which serves as only Methods Planning, but Time Study, Plant Layout and Equipment and Production Shop references, as well. It's the first step for processing the aircraft job.

► **Training**—Republe's first training class started near the end of 1951 with only eight trainees. All had some sort of selected background. The training plan was set up initially for a six-month period, with the idea of extending progress clearly for future guidance.

It developed that four months of training was sufficient for this group to bring the men to the point where they

IDEAS

in the making



Sheet above is a single curved wing panel and is a primary structure in a high performance Chance-Vought aircraft. The type of aircraft in question is the F-104. The thin sheet of aluminum is being used to control cost and to reduce weight.

Sheet below is a section of a typical cantilevered centerline wing leading edge and spar assembly. It is made of carbon fiber and epoxy resin. The thin sheet of carbon fiber is being used to control cost and to reduce weight.



The advancement of design and manufacturing in assembly aircraft components with the "Redux" Process, as developed by Dr. H. A. de Bruyn, Ciba distinguished scientist from England, has been anticipated engineering and public attention both here and abroad. In response to long-standing inquiries from American universities, engineering societies and aircraft companies, Dr. de Bruyn has just completed a specially arranged lecture series preceding before three groups from coast to coast.



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REDUX

The "Redux" bonding Process, developed by Ciba's subsidiary, Aero Research in England, makes possible the maximum assembly of primary aircraft structures in assembly aircraft. The "Redux" "Crown" sheet, shown above was specifically designed to use the "Redux" Process in the assembly of its components, and was itself directly from the aircraft bonded assembly it represents. The development of the "Redux" bonding Process by the aircraft industry has been demonstrated further by its adoption as standard procedure in military types as well, such as the U. S. Navy's "Cobra" and "Folland" jet fighters built by Chance-Vought.



► **REFERS OF PUBLISHED PAPER BY DR. H. A. DE BRUYN ON THE "REDX" PROCESS** and related data sheets have been assembled in a special reference file folder to serve as a preliminary guide to aircraft engineers in evaluating and using the "Redux" bonding process. Complete engineering assistance and information on the use of the process are available from Ciba.

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could be brought into Pima Wing for handling the simpler work, then go growing gradually.

From that point, the training program continued with class kept to about 10 trainees. Successive classes were started as supplements full new men into the plant, as that is many as ever classes were held at one time.

The training course consisted of a general fundamentals phase followed by two spent in all the manufacturing steps—tool, parts plant and machining, subassembly, and final assembly. This part curriculum was included, there was a small amount of work with practical mathematics, and study of Republic's engineering manual.

The last month of instruction was aimed at preparing regular processing jobs going on in the plant. These assignments were checked by Pima Wing project engineers and retained with classified instructions. Instructions were expanded from the Pima Wing training and were used.

The training program ended only this year, after about 70 men were trained. This seems a small return for all the effort—but this was an order way of putting these men with this amount of knowledge.

Meanwhile, other men were hired with continued outside substitution and still others were "borrowed" from the Production shop. Total force in the overall Manufacturing Methods division now is 260 men.

► **Good Results.** Under the processing section head, there is a production inspection group which coordinates the work with the various shop sections, initiating corrective action for production needs.

Beyond the new division are a class action, aimed at the team production grades were transferred to Production Division to give them a closer look at another phase of manufacturing. Some of the early team graduate have been advanced to Tool Planning.

Rapide has found that its training course has been more than justified. It has given a high level of talent in the Manufacturing Methods section. These have been good reports on recent production in other plants of work to which they have been assigned.

It has frequently been shown that a leader goodly fitted into the manufacturing whose cause quickly than another who was having experience in another plant, because the former was graduate from the beginning in Republic's methods.

Reprieve of heads acknowledge that the virtue of planning in our plants has located the men efficient and early of the newcomers but also of the various sections concerned with manufacturing.

The benefits realized have been so pronounced that Manufacturing Methods even a confidence, using the procedure for natural production pencil



AVON RA.7 with 7,500 lb. thrust is now in production at Rolls-Royce plants

New Avons Pass Military Tests

(McGraw-Hill World News)

London—Rolls-Royce has increased the security just a bit on Britain's most heavily ordered jet engine, the Avon (Most Fighters, however, will be powered by Armstrong Siddeley. Supplying engines.)

Afterburning, says Rolls, will almost halve the time in climb in the aircraft service rating for almost the same expenditure of fuel. It will very considerably raise the maximum altitude at which a fighter can operate. "Speed is the thing, of course, and 'the higher the speed, the greater the threat posed,'" says Rolls. An afterburning system "which can produce 50% greater thrust compared with standard RA.7" at 700 mph and over 65% at 1,000 mph.

Afterburning must be limited to short duration, Rolls adds, since it makes aircraft fuel consumption much higher. But still, the company continues, "at constant the most economical speed of flight, afterburner will pose a military type test."

An English Electric Canberra, fitted with two afterburning Avons, sponsored at Farnborough last fall, it is known that both the Hawker Hunter and the Vickers Supermarine Swift will be

equipped for afterburning. Both the Swift, which is to come into service this June, and initial deliveries of the Hunter will be powered by Avon (Most Fighters, however, will be powered by Armstrong Siddeley. Supplying engines.)

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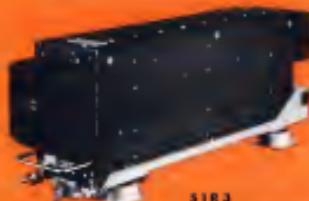
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51R-3



17L-3

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17L-3 180-CHANNEL VHF AIRBORNE TRANSMITTER — Frequency range is 118.0 to 135.0 megacycles, and all 180 channels are easily selected on a simple, positive remote control system. Power output is conservatively rated at 4 watts. Handbooks of these dependable transmitters are now furnishing commercially reliable service.

17L-3 360-CHANNEL VHF AIRBORNE TRANSMITTER — Transmitting facilities are provided on all channels reserved for aircraft communication in the VHF band. Ease of operation and dependability are the state of the art of the Collins 17L-3, for power output is increased to approximately 45 watts and 30 ke channel spacing is provided.

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a COLLINS report on electronic developments in AVIATION RADIO EQUIPMENT



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6185 144-CHANNEL HF TRANSCEIVER — Airline transmitting/receiving equipment with 100 watt power output on 144 crystal controlled channels. Automatically tuned channels assure maximum flexibility and high power output.

485-4 16-CHANNEL — 30-FREQUENCY TRANSCEIVER — Transmitter/receiver for commercial or executive aircraft. Frequency range of 2.0 to 28.5 megacycles. One hundred watt power output.

180L-2 AUTOMATIC ANTENNA TUNING UNIT — Automatically matches 385 or 6185 output to aerials, antennas.

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4785 GLIDE SLOPE SIGNAL GENERATOR — This unit provides crystal controlled test signals for bench testing Glide Slope Receivers in the band 329.5 to 335.0 mc.

4785-2 IFS TEST EQUIPMENT — Bench tester for Collins IFS Computer, automatic pilot and other flight director equipments.

4795-2 SIGNAL GENERATOR — This is precise ramp-out equipment for airborne VOR, localizer and glide slope receivers.

4795-3 AUDIO SIGNAL GENERATOR — Generator is used in precision bench testing aerial maps, localizer and glide slope receivers. Output signals for VOR, localizer, and glide slope audio circuit investigations are provided.

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at Bell's Derby and Glasgow lines, or coming into production at Bristol Aeroplane Co. Ltd., or Standard Motors Co., Ltd., Coventry. A fifth production line will be that of a factory run by D. Noyes & Sons, Boreham, Essex.

The RA7 is likely to be the powerplant for P-88E Sabres and English Electric Canberras produced in Australia. Many of the RA7 coming off the lines now will incorporate antiicing provisions. This "is essential for engines having such a major concentration at the Avon," Bell says.

The other types of Avon being produced at this date are the RA3 and its civil version, the RA 9, both thrust-rated at 6,500 lb. The RA9 is the powerplant for the Comet 2. Initial deliveries of the Comets were powered by the smaller RA3.

Now the RA14. No details are available of the Avon 14, but, acknowledging Avon, the RA 14 and its civil version of 4,000 lb. thrust. This latter engine, Avroarane Whittle will build first, will be known as the RA 16 and will power the Comet 3. In light of the fact that de Havilland is following a very conservative policy of powering its Comets with derated jet engines—that is, engines rated below their maximum possible thrusting—it is fair to assume that the RA 14 will exceed 10,000 lb. thrust in service.

It is also assumed that the Vickers Viscount transport brother will be the first service aircraft to use the RA 14. On the specific weight side, each pencil eraser weight has been increased on the RA7 engine to a credit of 10 percent. To meet the loads imposed on static seals on fighter aircraft, the thrust/weight ratio has been increased to 10:1. —NMK

PRODUCTION BRIEFING

► Bell Jack Scientific Instrument Co., Selenia Beach, Calif., has received three additional USAF contracts for development of high-altitude pressure-tolerant helmets, man-activated electronic circuit controls and junction interlockers.

► Solar Avionics Co., San Diego, Calif., has been awarded more than \$30,000 in contracts from Grumman. One award covers design and manufacture of six anti-handled T-29 solar-energy-powered cabin systems; another contract is for construction of T-29 and Convair-Liner exhaust augmentation.

► Standard Biscuit Co., Jeckylltown, Pa., is completing a \$10 million assembly and new-plant expansion program which will place more than 650-

000 sq. ft. of integrated floor space under one roof. The firm makes biscuits, aircraft specialty parts and shop equipment.

► Lockheed Aircraft Corp. has started work on a \$15-million enlargement of facilities at Burbank, Calif., to expand output of multi-engine military aircraft. Completion is scheduled for early 1958.

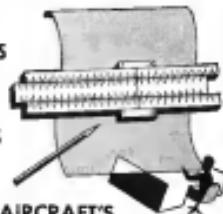
► American Standard Products Co., Hartford, Conn., has completed a \$1.000,000 B building in this city for production of precision scales for jet engines. The firm employs 250.

► Convair-Ft. Worth set a new safety record in 1957—since last year, the firm's injuries lost time was approximately one-fifth of one day for each employee. Disability pay rate was 3.5 per million man-hours worked.

► Penetron Co., Inc., Brooklyn, N. Y., has completed construction and is in the process of its finalizing facilities to insure later usage as an hub of avionics maintenance chemicals. Under the new setup, the firm has warehouses in Cleveland, San Francisco, St. Louis, Dallas, Chicago, Portland, Ore., Los Angeles, Charlotte, Detroit, Atlanta and New York.

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How Plessey Plant Escaped Buzz Bombs

These photos and the drawing at the top of the page illustrate one approach to the problem of making important features back-paced. During World War II, after the Nazis had bombed out the Fleischy company's plant, the U.S. moved an apartment into a more completed section of the Leipzig and sub-system. Thus, from base bombs, the Bf 109, East, company carried on operations through the example of *Die Fuehrer* with its predominantly technical work force. An electric-powered railroad was on service gauge tracks through the tunnel to feed the machine and the site over finished roads.

The photos shown on this page were obtained recently from Peaco Products, Bedford, Ohio, whose people were among the story made by Pleasey in the underground factory.



¹⁰ Although the MIS was not further developed, this based on a when asked

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Source: Farnborough, Compton, Inc., and Airline. Art with illustrations by Harry Anderson & Son.

Mobil oil

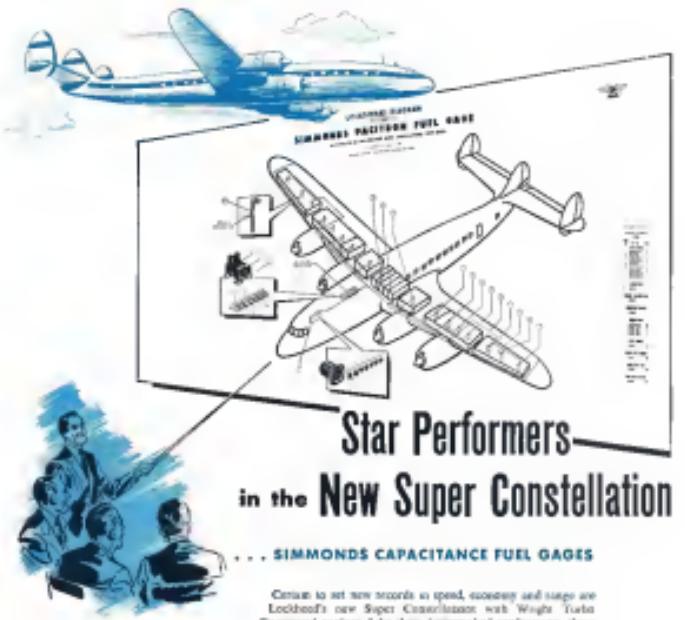
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INTERPRETATION of many factors governs effectiveness of weapon systems.

cells with cutting equipment down.

Profile see if fuel burns a malleable lesson in a single clause instead of causing a string of other failures in untried clauses. This saves considerable trouble shooting and repair time, Page feels pointed out.

► **Another Solution.** The use of ultra-conservatively rated components may not be a satisfactory solution to the reliability problems in avionic equipment when size and weight are seriously important. J. M. Bridges of the Navy Bureau of Ordnance suggested other possible sources toward improved reliability. He called for "more thorough engineering" before the electronic equipment goes into production.

Pointing to a large number of both the military and civilian fields, Bridges warned that "we want direct funds from research not put them into engineering and testing." He called type testing of prototype equipment "a waste."

► **The Third Approach.** — Bridges also warned that "we have gone too far toward automation." He called for the "elimination of unnecessary gadgets" and reminded engineers that their motto should be "It has to be able to work in battle."

Admitting that the military's "miss-timer factor has not kept pace" with the growing complexity of modern weapons, Bridges said that "we must step up training and get better battle experience."

► **In the Heat of Battle.** — One phase of equipment design has frequently overlooked is the complexity of its operation from the user's viewpoint.

Nordlund's paper said: "The failure to apply 'human engineering' fundamentals to design sometimes results in equipment which requires 'in many painful actions (by the operator)

at a time of great emotional stress, that his ability to reason and estimate is destroyed.' For example in World War II, 'Gunn men in bombing, as recalled from the operator actually failing to perform some important calculations or ... making an erroneous calculation...'" Nordlund's paper said.

The disparity between (inherent reliability) and actual operational accuracy (as World War II) was enormous because of the large demands made upon the human at the wrong time," Nordlund's paper added.

► **Physiological Approach.** — Electronic equipment does not have to be even "perfect" when it is suddenly required for emergency breakdowns to be effective," Dr. R. J. Coover, an industrial psychologist with Dunlap and Associates, Inc., "Physiological knowledge and research techniques, recently called 'biocybernetics,' can help to optimize human performance..." Coover added.

He described the results of a series of tracking tests in which 15 subjects were classified on their ability to move a control stick or handle to maintain an instrument needle centered. The test resembled the task of a pilot making an ILS approach. Tests were run with various combinations of pitch, average, and yaw controls, and good, average, and poor visual aids.

The results of these tests, according to Coover, showed:

- Good control and a good indicator, 1% tracking error.
- Good control and as average indicator, 10% tracking error.
- Good control and a poor indicator, 20% tracking error.
- Poor control and a good indicator, 10% tracking error.
- Poor control and as average indicator,

15% tracking error.

► **Poor control and a poor indicator, 30% tracking error.**

Coover concluded that "there must be a causal or expected relationship between control and indicator for best performance to be obtained... The natural environment requires longer learning and tend to break down under stress," he said.

► **Another Audit.** — The psychologist can also help the engineer decide whether a design improvement justifies the added cost and complexity, Coover pointed out.

For example, the addition of a plus or minus 5% color scope may not increase the accuracy with which the operator can read target range and bearing, but it will reduce his tendency to do it with a compass, Coover said. Thus, more accurate color scopes might not reduce down-panning sufficiently to make a system less effective, particularly if the operator is trying to track a fast moving target, Coover concluded.

► **Using the Operator's Task.** — The introduction of radar bombing systems late in World War II actually lowered bombing accuracy at first despite the fact that the radar bombardier was inherently a more accurate instrument. This was one of several interesting observations possible from a set of curves shown in connection with Nordlund's paper.

The reason for this anomaly, Nordlund's paper explained, was that the introduction of radar complicated the operator's task in such a way that operational reliability was reduced.

This situation was corrected when a new system (previously the Sprague K-16 bombing system) was introduced in 1946. The new system was designed "to let the human operator," Nordlund says. However, the new system was so complex from a standpoint of accuracy, that the Air Force at first couldn't keep it operating. So, despite higher accuracy and simplified reliability, the new system was ineffective because of low operational reliability.

Operational reliability of the new bombing system had just begun to rise, when a new and more complex version of the system was introduced. The operational reliability again increased.

► **What Nordlund calls "optimistic" and very expensive "bootstrapping" operation in which basic mistakes of installation which adversely affected the equipment's environment were corrected.** The USAF set the operational reliability curve on the upgrade. Since 1949 operational reliability has continued to climb, Nordlund's curves show.

► **Significant.** — Coover's significant finding about Nordlund's curves, which at best are only an approximate estimate, is that the operational accuracy curve

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but continued to run in spite of the
fracture of the other engine. Nordlund
thinks that it proves that the damage
in later of circuit problems was a
second one.

There is no room for complacency,
Nordlund warns, pointing out that "in
likely" at present for him to expect
that "We are going for the high -
prior to maintenance, shutdowns and
overhauls," he says.

► **Mouse of Virtuous Tales.** The
Mouse One failure is like failure in
any application of vacuum tubes, John E. Graham of the Signal Corps
Engineering labs said. "This is a serious
radiation-induced vacuum tube fail-
ure and the Number One cause of
equipment failure."

Graham's statement is based on a
Signal Corps study which shows that
although tube life need not be affected
by the type of equipment (radio, com-
munications, etc.) on which it is used,
the Signal Corps has found a
10 to 1 variation in tube life between
different types of equipment.

Graham concluded that "useful ex-
pansion of circuits can improve average tube life by a factor of 10."

► **Tube Application Handbook.** "If all
equipment used tubes correctly and
at all times within the parameters set
out in the JAN specification sheets
... there would be a fair degree of
reliability as to a safe life expectancy,"
Graham said. Because this isn't done,
the Signal Corps, according to Graham,
is now questionnaire a program to study
the effect of different factors (other than JAN
spec) operating conditions such as
variations currents, voltages, condensers of
vibration, and temperature on the life
of tubes.

From these studies, Graham and
the Signal Corps hopes within two or
three years to publish a handbook for
electronic equipment designers which
will enable them to predict tube life
under the specific operating conditions
required for their individual equip-
ments.

Military electronics manufacturers
need not wait until a handbook is ob-
tained to help in current tube application
problems. The Paul on Electron
Tubes (of the Research and Develop-
ment Board) will send a team of spe-
cialists to meet design engineers. Con-
tacts may be made.

The panel consulting team usually
consists of three engineers drawn from
different tube manufacturers and re-
search organizations plus a military
service engineer.

The Signal Corps hopes to extend its
study of tube failures in Korea to ab-
sorb combat data, Graham said. With
such information, the Signal Corps will
be able to prepare specific notes of
tube and circuit improvement. Cor-
rections predicted. The data will also



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allow the Signal Corps to make comparative evaluations of the reliability of different communications equipment.

► **Improving Tube Reliability**—Meanwhile the Signal Corps has begun the first step in a research and development program to further improve tube reliability, Gerhman said. This is a study of possible automatic production techniques for manufacturing either tubes sub-assemblies or the complete tube.

Although no results are yet available, Gerhman said that there is considerable reason to believe that this type of approach will improve reliability by eliminating variable factors due to human operators and by streamlining and simplifying tube construction to permit automatic assembly.

FILTER CENTER

► **AC Power System for DC-8**—Douglas Aircraft Co reportedly is planning to use 120/208-v. 400-amp ac generators (driven at 500 rpm) as main power sources on its new DC-8 jetliner, replacing the 380-v. 400-amp standard as power equipment which would do the job separately but from a much smaller 400-amp generator or from rectified 115-volt dc.

► **String-Ear Gas Canner**—Balley Corp. of New York City, which makes

new USAF-type N-9 gas canisters (canisters and its lighter and heavier to record aerial combat), has developed wire remote control which uses photo cell to measure wave brightness and to adjust automatically current exposure. Used for such a device would become military search light synchronization to order this for gas canister makes it possible aerial aerial control. New Balley development continuously maintains correct exposure over wide range rapidly changing light conditions. Design uses an tubes and operates from 24-volt dc.

► **ETI to Get McD. Dumper**—Contractor is contracted with Minneapolis-Honeywell to furnish a pin and patch dumper system for its new F3Y water-based Navy fighter, the Skyray.

► **Pioneer's New PB-10 Autopilot**—Elliott-Pioneer Division of Bendix Aviation will soon begin demonstration of an advanced version of its PB-10 surface/transition autopilot. Designated the PB-10A, the new autopilot has improved roll and damping, better nose coordination, a new console controller, and new integration for improved barometric altitude and magnetic heading control. The Navy is currently building a PB-10A in an RSD for evaluation.

► **Army Test Glaser AD8**—Army is testing a Glaser Corp. subsonic three-ton glider at Massachusetts (N. T.) County Airport for possible use on Army helicopters. Glaser AD8 can play a double-loop maneuver developed by Emil J. Strohm. Interim test use of these actions reportedly gives AD8 a few more level. Present experimental total weight 67 lb., but Glaser thinks it can be reduced to about 18 lb.



HYBRID WAVEMETER

Recently, newly wavymeter is one of a number of hybrid aerospace components which have been redesigned by Dynamics Research of Bedford, Mass., for operation between 5.5 and 6.5 km. with center 11.5±0.25m. weightless when weight and volume are at a premium. The components were originally designed for use with 7.62-mm. wavymeter normally used in the 1.55-to-5.5 km. region. The hybrid components can be used with 1.5±0.25m. weightless originally designed for 5.5-to-8.25-km.



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MCDONNELL FIGHTERS

The McDonnell F2H RAMBLER is a single-seat fighter aircraft. It has a straight wing, a single vertical stabilizer, and a single horizontal stabilizer. The aircraft is shown in flight, with its landing gear extended.

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end of the field that the Swift was exceeding the DC-6 from the rear, the controller, only a very few seconds before the collision, advised as follows: "MORANNEA GIVE WAY TO YOUR RIGHT OR LEFT, MAKE A TURN OR TURN IMMEDIATELY TO THE LEFT."

The transmission was made after the Swift had crossed the path of the DC-6 from left to right. The controller did not use the controller. In the last but earliest that there was imminent danger of collision he had no opportunity to issue a transmission. In the opinion of the DC-6, in addition to the last transmission which he had given in the pilot of the controller would.

It appeared to the controller that the pilot of the Swift immediately made an abrupt left turn, crossing the transmission, and then again recovered his stability. He stated that the Swift appeared to be flying at constant altitude at all times before the crash. The controller testified that he did not know that the Swift had not exceeded the DC-6, as was his impression, until immediately before the time that it was in front of the DC-6 during the earlier portion of the Swift's flight.

Investigation disclosed that the controller had over six years experience, and his stability as a controller was entirely satisfactory. He had served in the United States Army from 1919, and in addition had a number of other flying experience, pilot ratings, and physical defects or impairment of vision were found at the time of his last CAS Class II physical examination completed on June 5, 1952.

The approximate position of the two aircraft at various points along their respective flight paths were obtained through statements and testimony of the DC-6 pilot, the controller, the DC-6 controller, and the Swift pilot, Swift controller, and the controller of ground witnesses.

Examination of the Swift wreckage indicated that the aircraft initially struck the ground nose-down 30 degrees, right wing first, then came to rest on the lower edge of the fuselage. The trailing landing edge of the left aileron fell separately striking a house located some 250 feet from the main wreckage. The left aileron struck about three feet from the main wreckage, approximately 30 feet from the main wreckage. The landing gear and flaps were extended. The structure was found set at 30.10 inches; this setting has been transmitted to another aircraft for the Lovell Field test facility at 0640. There was no evidence that any component part of the aircraft had malfunctioned or failed, with the possible exception of the VHF transceiver.

The shattered left wing panel revealed five propeller hub projections in sequence from the trailing edge toward the leading edge of the wing panel. Study of the hub indicated that the wing of the Swift was struck on the left side, and that the Swift had a left hook upon collision.

The radio equipment installed in the Swift was not severely damaged by impact to determine its operating condition, with one exception. The Marconi VHF transceiver was found loose connecting the transmitter to the

antenna fell free from its plug during inspection. The portion of transceiver located in the plug was covered by insulation and since this was not evidence of a recent impact, it was determined that the antenna lead had been properly soldered. The right antenna was in good condition for the past transmission, however, investigation indicated that the transmitter and receiver transmitted properly during a flight made by Lt. Brown the night before the accident.

A General Electric Model 45B 1000 kw transmitter was connected with the VHF transceiver.

The GEC transmitter was equipped with a crystal for transmission on 118.0 megacycles. The VHF crystals were found to be correct and in frequency. The radio controls and transmitter were found to be in the normal VHF transmitter on 117.0 megacycles, and receiver tuned to 118.0 megacycles (Marconi receiver frequency).

During to the DC-6 command of Nels just minutes to all three blades of No 4 propeller, the high frequency radio antenna was severed from the aircraft. The antenna fell out of the cockpit, struck 22 feet forward of the rear insect and broken; damage to the antenna connecting cable and antenna lead, and slight damage to the fuselage near antenna connection.

The structure of ground witnesses and statements of ground witnesses, and damage to the aircraft firmly established that the Swift went over the top of the DC-6 after being struck by the propeller.

It was also undoubtedly established that the DC-6 and the Swift were the only two aircraft involved in the vicinity of Lovell Field and no other aircraft was landing or taking off.

The radio controller was assigned to the 2480 to 2480 watch, as in the usual fashion of Lovell Field, when the controller received the word "crash" was approximately 10 seconds after the accident occurred. However, the radio controller can definitely stated that he did not provide any information over handsets on 2480 watch.

Although the flight level was on control altitude, right wing first, parts of the aircraft were found to be scattered and bent and were partially dispersed. The last CAS physical examination revealed no physical defects or impairment of vision, the witness was also told of Mr. Brown the pilot of the Swift.

The set at the time of the accident was 37 degrees high and 21 degrees to the left of the DC-6's heading. Weather was clear with the temperature about 25,000 feet pressure 17 inches on mercurial, and wind winds northeast at 30 mph.

ANALYSIS

The proximity of the two aircraft just before the collision, combined with the closing speed made it impossible for the pilot of either aircraft to take effective evasive action. It is questionable that the aircraft could have been able to make a turn and avoid the Swift, since the Swift had a left hook upon collision.

The radio pilot failed failed to educate his intentions to land while still some dis-

tance from the airport, or was unsuccessful in attempting a transmission to the tower for an evasive maneuver necessary for safety. The aircraft was not controlled by the controller, but the controller would have enabled the controller to be apprised of the aircraft's position, and approximate speed, then he would have had time to properly space the two aircraft.

It is believed that had the Swift not adequately maneuvered to locate the DC-6 earlier in a query addressed to the controller or efforts to slow the aircraft, if the recovery (pilot to the rear controller's final maneuver) was made with the

The Swift was assigned No. 2 landing sequence shortly after the DC-6 passed over the outer marker and was given clearance to land No. 2. No broken transmission was received by the controller, and he indicated the aircraft would be indicated for landing to two miles (3.2 km) and the aircraft maneuvered accordingly thereafter. It is about three miles from the outer marker to the turn of the approach.

It is also indicated that the pilot of the Swift took adequate measures to locate the DC-6 earlier in a query addressed to the controller or efforts to slow the aircraft, if the recovery (pilot to the rear controller's final maneuver) was made with the



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object of locating the DC-6 at did not satisfy that purpose for the Swift pilot, thus placed his aircraft in a position where collision was inevitable.

Since the Swift pilot had known areas available to the Swift for a number of months, he should have known areas of the local airport traffic rules, as required by Civil Aeronautics. One of these rules requires aircraft equipped with transmitters to call the tower twice 10 minutes from the airport. Had the Swift pilot done this, he would have been aware of the need to comply with the tower's instructions to land No. 2 behind the DC-6. He was, however, somewhere between the outer marker and point of collision, indicated by the words "straightaway approach," but he intended to make an approach.

Owing to influences that the controller in the Swift was intentionally deceptive, it is not known whether on either time was attempted. The DC-6 radio contacts were made in accordance with operating procedures.

If time had been available, contact could not be established, owing to traffic. It was the duty of the Swift pilot to approach the traffic pattern with caution, complying with all traffic rules for the VFR flight. Since two-way radio contact was not established, he should have proceeded with care to the point that collision was imminent in the area. It appears, however, that he proceeded, without the outer marker to land runway 13 without exercising reasonable prudence in his approach.

Although the two aircraft were restricted to visibility, the line of sight between the DC-6 and the Swift was being made. Ground and the right time to begin approach would have rightly descended rather than directly into the nose. Owing to the small size of the Swift and the distance, the descents that probably started below the high-speed turns to an altitude of 1,000 feet, then, using the Swift shall to start.

During the right turns of the DC-6 the Swift could not well have been in a blind spot to the nose of Flight 510. From this point on, cockpit reactions and the acts of the Swift pilot were in accordance with time to time. Investigation indicated that the Swift would not have been visible to the nose of Flight 510 until only a second or two before collision. The Swift's exact altitude, heading, and speed cannot be accurately determined.

The pilots of the DC-6 were not aware of the Swift's position in the area in the seconds just before impact in the nose, and, had they been, reached the outer marker and had recovered clearance for landing. In the short time taken to this point the Swift had, to the point of collision, the pilots of the DC-6 failed to sight the other aircraft, but the Swift's timely recovery from the right turns below the DC-6 was, therefore, especially strong during the encounter.

The Swift was in such a position relative to the DC-6, especially as the situation became more critical, that the point of the large aircraft was visible to the Swift.

PROBABLE CAUSE

The Board determined that the probable cause of this accident was the Swift pilot's failure to maintain reasonable clearance to other aircraft, and the Swift's timely recovery from the right turns below the DC-6 was, therefore, especially strong during the encounter.

BOARD:

- (1) Gerald R. Farnsworth
- (2) Joseph A. Adams
- (3) Cleve Grawey

WHAT'S NEW

New Publications

The *Air Traffic Story*, prepared by the Radio Technical Commission for Aeronautics, is designed to give its readers a working acquaintance with the trans-verse-pulse Coherent System of navigation now coming into use, the main features and general requirements which the system employs, and the role that each plays.

In extremely interesting and easy to understand language, the 108-page booklet traces the historical development of navigation and its use to the present system. It then discusses trans-verse-pulse operation of each type of equipment in non-technical language. Following that, the reader continues upon a hypothetical flight with a step-by-step report on cockpit navigation equipment required in using the Coherent system.

A glossary of standard navigation terminology and a comprehensive index complete The Air Traffic Story and make it a basic reference for the field of civil air navigation.

Copies are available for 90 cents each from the Radio Technical Commission for Aeronautics, 1724 F St. N.W., Washington 25, D.C.

Improvement of Turbine Diskage Transportation Control is a four-page informative letter from a series, being distributed by Pratt & Whitney Aircraft Division, to persons who have an interest in the use of the diskage system. The bulletin can be had in P&W's Manual of Aircraft Gas Turbine Operations under binder.

Unions subsection for identification of all items purchased by the Defense Dept. is included in an index being distributed in limited quantities by Air Materiel Command to contractors and manufacturers. The new index gives a convenient supply "handy" to all Air Force, Navy and Army members. USAF contractors may receive the applicable Part 1 of the guide from the Comptroller and Purchasing Division, Directorate of Supply and Services, Bldg. 100, AMC, Command Air Materiel, Wright-Patterson AFB, Ohio.

Telling the Market

Test equipment and tools are detailed and prices given in catalog available from Richtron Int., 885 W. 35th Ave. St., San Gabriel, Calif.

Commercial aircraft station data folder 1950 describes and pictures the

1950 line being made by Jack Electronics, Inc., Cleveland 1, Ohio.

Indoor start chart speed station for up to 30 days on a single roll are covered in horizontal data chart 811 being distributed by Midtron Instrument Co., 412 Lincoln St., Denver 9, Colo.

Special glass slides used in manufacture of tools, fixtures and jigs for aircraft production are described in data sheet PG-100 available from Montague Graphics & Manufacturing Co., 82 Library St., N.Y. 6, N.Y.

Bell space assemblies, wire grates, directional horn-type sources and other products of Vail, Inc., Pasadena, Calif., are described in new brochure being distributed by firm. Also carried in the company's products folder.

Electrical equipment of a diversified character is covered in a new series of bulletins from Int'l. Inc., Los Angeles. Solid-state control (solid-state semiconductors in parentheses) are engine generator, master (GG or SG), self-gated engine generator (GG or SG), master and auxiliary regulated rectifiers (RR, app. 852), Magna-Volt low voltage regulated direct-current power supply (KMRSPN74), and power source supply unit for computers (PFS 852).

Variable ratio VMCR surface control applications and technical data on specifications and installations are contained in technical sheet 12, a 16-page booklet available from Relubolt Co., division of Union Carbide & Carbon Corp., 268 Madison Ave., N.Y. 16.

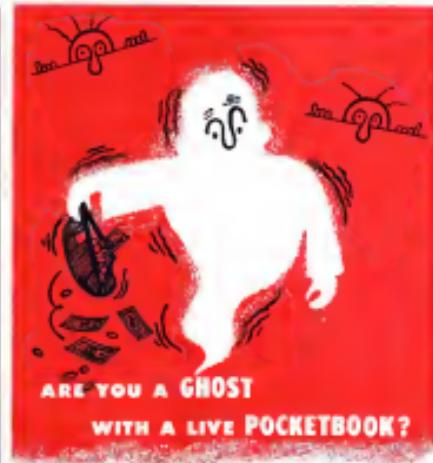
Publications Received

■ **The Atom Shop**, by J. G. Farnsworth, pub. by Philosophical Library, Inc., 13 E. 38th St., New York 16, N.Y. 1951, \$10.00. Contains 100 pages of the "Beginners Guide" for converts before Gadgetry and ends with a series of forecasts for the future.

■ **Atomic Submarines**, by Admiral Louis Mountbatten, pub. by Philosophical Library, Inc., 13 E. 38th St., New York 16, N.Y. 1951, \$10.00. Contains 100 pages of the "Beginners Guide" for converts before Gadgetry and ends with a series of forecasts for the future.

■ **Popular Mechanics Almanac of Aviation**, by Edward L. Thomas and Leo S. Cramber, pub. by Popular Mechanics Co., 1955, \$1.00. Story of aviation from ancient times to the present.

■ **Principles of Aerodynamics**, Pitman Aeronautical Engineering Series, by Daniel G. Dierckx, pub. by Pitman Publishing Corp., 2 W. 28th St., New York, N.Y. 1953, \$7.50. Dierckx and defines the physical laws which are basic to aerodynamics and the methods used to apply these laws to specific problems.



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pounds less than an expansion turbine of comparable output, Henn added.

Initial cost of the gas-turbine refrigeration machine will be about 20 percent that of an expansion turbine with matching performance, according to Henn.

Efficiency of the blade and in terms of horsepower requirements is considerably greater than expansion turbines, Henn concluded that the fans are ten to 15 times more efficient with the power needed by the expansion turbine of the same capacity.

Efficiencies of current DCT-10000 data could not have been met, he says, if it had chosen the expansion turbine cooling system.

► **Unexpected Developments**—Further pointed out these unexpected difficulties which American hopes to overcome as a result of its decision to go to forced cooling.

► **Ground cooling**—The fan system is capable of delivering at all full five tons of refrigeration when the aircraft is on the ground with engine dead. Current to operate the system is supplied by the aircraft/generator set which is normally connected to the plane to supply power for light, engine starting, etc.

AA makes a separation fan set of the aircraft to blow air into ground ports, separate air into the cabin. The blown's output is about 25 lb/second of air ample to supply all cabin requirements on the ground. The data states need for a \$12,000 refrigeration truck, as well as the vehicle's metric, name and the value of its operator.

► **Fever**—Inches, American, like other criteria, has been representing cabin speechlessness failure point during altitude



VENTILATOR FIX

Northwest Airlines cut replacement of DC-3 magnetos ventilation from 7500 down to 15 and saved \$1,015 in 1952 by using a vent (right) in place of louvers to keep stink shells in the ventilator from whirling loose. Wire could not be drawn down and wire gauze (left) is just because of vibration and vibration. Men at Standard Laval's, motor division of NWA's St. Paul, had

AVIATION WEEK, April 15, 1955

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RIVITORS

R-2 RIVITOR used for automatic clinch plate assembly. Sets one and 1/2" rivets during a four fold job—riveting, setting, inspecting and reworking.

R-2 RIVITOR sets two rivets at one time. Equipped with 1/8" hoppers, and toolied to automatically feed and set two 1/8" dia. x 1/8" long, wrap head blind rivets in a clinch plate and rivet or rivetor flight assembly for fair implements. Controlled by one foot pedal.



CLINCHORS

T-1 CLINCHOR uses one of two special rivets. Rivets are held by a large automatic body magnetizer. Rivets are clinched in a variety of square, panel, belt and right hand.

T-2 CLINCHOR sets two rivets at once! Toolled to feed and set 9/16" x 1/8" x 3/8" neck blind rivets at each operation. Clinches rivets by one hand-operated valve. Adaptive to wide range of clinch riveting problems.

Rivet production . . . save labor with T-1 Rivitors and Clinchers for many assembly jobs today . . . in aircraft, automotive, farm machinery, stampings of all kinds.

T-1 CLINCHORS are efficient 3 to 5 times faster! Fully automatic . . . controlled by a single feed perch! Available in Underdrive and High Speed models, rivets depths 8" to 36".

T-2 RIVITORS automatically feed and set solid rivets . . . with high production! Electrically-powered Rivitor sets 1/8" to 1/2" dia. blind solid rivets up to 3/8" long. Air-powered Rivitor sets aluminum alloy rivets up to 1/8" dia. or steel rivets up to 1/2" dia. and up to 16" long. Rivets depths 8" to 36".

Write for Circulars And Data 647, Rivitor holds fast and tight. The Tomkins-Johnson Co., Jackson, Mich.

37 YEARS EXPERIENCE **T-J**

TOMKINS-JOHNSON

BRIDGE, AIR AND VEHICLE STRUCTURES, OFFERS, GENERATORS

over months, because the units are forced to pump air against higher back pressures caused by operating the compressor turbines for cabin cooling. This heat is exhausted from the cooling surfaces through double the heat sink and disposed of in the airframe through a single pressureless location.

Since the front machine will be used as the primary cooling system, with expansion turbines cutting in only to take care of overheat conditions, the cabin overheat will be relieved of a considerable work load. Thus, American knows, will reduce maintenance fuel costs, help level off the fuel-hauling expenses, improve operation and reduce in-service operating costs.

Small Standard-Douglas was able to stow the front system in the DC-7i with a minimum number of useable space.

• Condenser and associated ducting was folded into the right wing fillet where it takes no valuable payload space.

• Compressor and compressor unit assembled in the forward section of the front cargo compartment where the two compressors take a total of 11 cubic feet of cargo space.

American officials feel that this is a small sacrifice to gain for the overall advantages of the front system.

• One From the Radio-Cities, Inc., manager for the DC-7i is substantially the same with the manufacturer.

applicable for Graphite beam. Originally the heat-treated compression-wire made of cast iron. The bus operator, in a parallel comment of some, a similar move by airline operators, quickly commented a proposal to tighten the compression by using aluminum in place of cast iron.

The cabin overheat's weight sometimes resulted in the beam exceeding maximum highway loads, which in turn restricted passenger loads.

To lighten the front system as much as possible, for instance, the Cessna team strip a step further. It redesigned the condenser and evaporator, as well as the compressor, in aluminum instead of copper. A standard refrigerant dryer in the front system keeps water out.

American hopes to reduce the overheat in its own design at a cost of less than \$300 per overheat. And the compressor is a double piece of machinery.

An overheat time of 4,000 hours is required by the American for aircraft use. This is required in its Boeing Statement. Another feature is set to be increasing the compression at 12,000 ft.

• Power Requirements—Total electrical load required by the front system is 450 amp when the plane is on the ground and 700 amp when the craft berths in airmen. The lower ambient heat is the result of shifting off the ventilating and condenser cooling fans.

which are not required in flight. American is getting larger ground motor/generator units. Airlines' spikes men point out that the move is not directly attributable to the front unit. However, it is a desirable and logical step, since the electrical requirements are becoming increasingly heavy at 12,000 ft.

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Although actual service experience will be the only way to prove conclu-

sions, the overheat is not expected to be a problem. The American team, for instance, has already tested out with the Robert Midd 371, which gives 1,000 amp compression, 1,200 for three minutes and 1,500 for one minute.

For the Pegasus—It is reported that Douglas engineers have built a complete and working mock-up of the entire DC-7 refrigeration system, including the reciprocators.

• Purpose—It is three-fold. First, the mock-up has already paid dividends in spotting sources of potential trouble prior to completion of the airplane. Now, the second will provide an ideal test bed for maintenance personnel of the various aircraft using the DC-7.

Finally, the mock-up will be kept operational after the plane goes into service. This will allow Douglas technicians to troubleshoot late difficulties without necessarily resorting to expensive flight testing.

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A Franklin aircraft engine has won the 1954
annual Lockheed Sweep of the Year

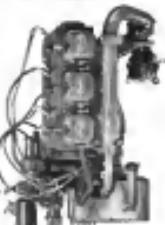


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over the globe

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Wherever they go, Hitler Helicopters count on dependable power from Franklin engines exclusively.

Franklin is the power source for the vast majority of all helicopters flying today.



AIRCOOLED MOTORS, INC.
SYRACUSE, N.Y.

AERONAUTICAL WEEK, April 12, 1958

As a flexible seal
for limit switches exposed to weathering
and temperatures below -100°F.
Silastic works
where other materials fail.



Photo courtesy Electric-Steel
Div. and Manufacturing
Company, Chicago, Illinois.

Illustration shows
a switch enclosed
in a weatherproof housing
designed to withstand
extreme temperatures.

for superior performance
specify

SILASTIC

the Dow Corning silicone rubber

Silastic stocks designed for extreme temperature applications are the only materials that will retain rubbery properties after continuous long-term exposure to temperatures from -80 to 300°F. For short-term or short-term exposure to temperatures from -130 to 500°F.

As a standard for low temperature performance, we call your attention to our data on modulus ratios, or relative stiffness as measured by the Goleman test method. According to these data (see Figure 1) the modulus for Extreme Temperature Silastic shows an appreciable change above temperatures in the range of -112 to -130°F. Rapid



change in the modulus for natural rubber and for most silicone rubber stocks takes place between -40 and -70°F.

All types of Silastic show excellent resistance to oxidation, weathering and to a variety of hot oils and chemicals. Silastic stocks for electrical applications are unique even among silicone rubbers for low water absorption and excellent dielectric properties combined with good physical strength.

Data and actual performance prove that you can count on Silastic to retain both its physical and dielectric properties after long exposure to outdoor weathering or to temperature extremes above and below the limits of natural or synthetic organic rubbers.

For literature, call your Dow Corning Representative or write: "When in Doubt" gives over 20 years leadership in silicone products and processes.

Mail to: Plastics Division, Dept. 34, Midland, Mich.
Please send me: Data on the properties and applications of Silastic stocks and processes.
 "When in Doubt" gives over 20 years leadership in silicone products and processes.

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Company: _____
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Combat tested up "MIG ALLEY"

"MIG Alley" has no near competitor for the title "World's Toughest Testing Ground!" Here, under the stresses and variables of a type of war without precedent in military history, men and equipment have been pushed far beyond the limits originally prescribed for them. Amphenol's cables and connectors, in fully meeting the most stringent of military requirements, have helped to make the electronic and communications equipment of our Armed Forces the most dependable in the world.

AMERICAN PHENOLIC CORPORATION

George M. Ahrens



ently that the DG-7 from Amphenol is as good as it looks on paper. And it's evident that gas-cycle refrigeration will be seen more and more in future aircraft.



Supercharger Tester Uses P-39 Nose Case

Crystal Aircraft mechanics have built up a nose supercharger and are investigating the nose case of a Bell P-39 Airacobra.

The set up is powered by a Chrysler industrial engine that delivers 86 hp. at 2,800 rpm. A 2:1 torque step-up is obtained by driving the supercharger through the P-39 nose case. The drive is reversed from the way it was in the aircraft—the Chrysler engine drives the propeller shaft and the supercharger is connected to the magnet engine drive.

To avoid the possibility of the nose case bearing out, the engine's ignition circuit does not close until the nose case oil pump has developed 10 psi pressure. The engine also incorporates a pressure balancer that removes pressure from the nose case.

The test equipment, complete except only the Western Gage supercharger that is mounted on Caproni's B-9 Gonneau. It is being converted to accept the Amphenol connectors and power cables used on 7-9 Gonneau.

Temperature and pressure, checked at seven points, the nose case, mainshaft bearing, supercharger bearing, supercharger rpm, supercharger oil pump oil in and oil out. Two additional points will be added for testing of the Amphenol units.

OFF THE LINE

Roku Aircraft Corp. has entered licensing agreement with Pacific Aircraft Inc. Corp. granting the latter exclusive manufacturing and sales rights to the

Is long service life at low cost your problem?

here's how leading tractor manufacturers
solve it with **NEEDLE BEARINGS**

Many makes of farm tractors specify Torrington Needle Bearings because of their relatively low cost and their long maintenance-free operation under rugged conditions.

Needle Bearings have been performance-proven on thousands of tractors in service on farms across the nation.

Their use on steering arms and knuckles provides easier turning, helps to reduce operator fatigue. On hydraulic controls and transmission assemblies where small size is important, Needle Bearings give high-capacity, anti-friction performance.

Manufacturers throughout industry have made Needle Bearings "standard equipment" in countless applications since their introduction nearly twenty years ago.

Perhaps your bearing problem can be solved by the Needle Bearing. We'll be glad to help you find out.

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When you need just a few pieces — when you're still in the experimental stage — then an economical, cooperative source of parts is important.

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Careful calculation determines the point at which labor costs warrant our **Sheet Run Method**, which uses simple contour dies and special part-processes.

Best of all, when you get into large quantities on the experimental part, our **Stampings Division** is still your most economical producer, using our **Production Method**. Thus all three methods are at your disposal. And impartial choice of method saves money for you!

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STAMPINGS DIVISION



1804 Union Street, Cincinnati, Ohio.

NEW AVIATION PRODUCTS



IMMEDIATE PULLING of both wings is one feature of Avmont system installed at Lockheed Air Terminal, Burbank. Plane shown is Tolka DC-4-type transport.

Pit Refueler Cuts Apron Hazards

Avmont, Inc., now busy in the pit refueling field, has completed an installation at Lockheed Air Terminal, Burbank, Calif.

The Avmont system permits simultaneous refueling of both wings of a transport in less than 300 gallons per minute. The refueling arm carries the hoses and control equipment and is easily moved to any support structure.

Avmont's installation at Lockheed includes three pits whose steel tops are flush with the ramp. Two pits contain 60 feet of hose on reels. The third pit houses mounting units, groundwiring, etc.

Also on the system is a 35,000-gal underground tank from which fuel is pumped through a water separator and research line by a 40-hp electrically driven turbine pump.

For protection is given by a Walter Kable system, including a 10-lb carbon dioxide bottle in each pit, act set by Kable temperature rate-of-rise fire detector.

Advantages cited for this application of CO₂ as an extinguishing agent are that it cannot damage pumps, lines or motors, is a non-conductor of electricity, eliminating possibility of causing short circuits and it dissipates into the atmosphere after discharge, leaving no residue to clean up.

Lockheed Air Terminal has only one pit refueling system using the Avmont system during the current test period, but four more positions may be operational moderately without additional pump facilities.

Avmont's address is 2627 Hollywood

Way, Burbank, Calif. Walter Kable is located at Belleville, N.J.



MEILER PIT is between two hose pits and is protected by Kable CO₂ system.

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Fuel Transfer Valve

A selected valve for controlling blend of fuel, pressurized air from jet engine compressor section to surface, fuel tanks to be pressurized by Vacuum Engining, Corp. The pressurized air provides pressure to move the valves in the various tanks to the air or tank.

The assembly is actually two valves in one, each with its own actuating solenoid. One valve is the seat which controls the transfer operation, allowing air to flow through to the venting

valve to prevent transfer power. The other decompresses the tank after the transfer, to minimize the possibility of air expansion.

At 10,000 ft the compressor may be as low as 1500. Valve seats, at the least rapidly decompresses as the air flows through the piping and into the tank. After the boundary air is pressurized for transfer, all that is required is the open fuel valve and let fuel flow to the same tank.

Valve attributes taken of the valve in this application are to put to the use of a "floating seat" and which a diaphragm has self-lapping and self-cleaning char-

GREAT "GOLDEN YEAR" AIRPLANE

Offers Over 150 m.p.h. Cruising



CONSTANT SPEED PROPELLER



"JET" TAIL THAT REDUCES DRAG



ROOMY, LUXURIOUS INTERIORS



235-H.P. ENGINE ...

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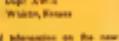
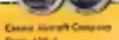
Never before in aviation's 30 years have business and private flyers been offered so much for their money! The "Golden Year" Cessna 180 is all new . . . and so beautifully designed that its flight characteristics are phenomenal.

It takes off in remarkably short distance — climbs over 14,900 feet a

minute—cruises at well over 150 m.p.h.

—yet makes safe, slow landings in almost any short field! It's all metal —it has every comfort and safety feature you could ask for—yet it's so inexpensively designed that its other costs of plane in the over-150-m.p.h. class. See it at your Cessna dealer—he's listed in the yellow pages of your phone book.

New Cessna 180



Circle 100 on Reader Service Card

Cessna Aircraft Company
Dept. AV-4
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Please send information on the new
Golden Year Cessna. I am interested in a
Cessna 172. _____/PC/Other
Name _____
Address _____
City _____ State _____

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WITH FORMED TUBES



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STEEL TUBES

FORMED TUBES, Inc.

Contact Our 401 Press St.
Sturgis, Michigan

activities. The girders are used in girders and the valve construction is of stainless steel and aluminum.

Volvo Engineering Corp., 104 Market St., Newark, N. J.



Tube Bender

New tube and bending press is designed to provide greater working clearance to speed handling of variety of multiple bends in different planes.

The machine, a vertical ram type, is rated for 20-ton capacity. It is hydraulically operated and features a unique combination of cam and cylinder offset on the press frame, minimum angle of bend of 60°, and return to starting position, variable speeds and closed-loop feedback for better clearance. The unit handles tubing with outside diameters from 1 in. to 7 in., with maximum wall thickness of .083 in.

Jones Engineering Co., Inc., Akron, OH.



Mobile Leak Tester

A mobile pressurizer leak test machine, tailored for fast testing of complete fuel and hydraulic systems on aircraft, has been developed by Device Engineering Co. The equipment works

"air-spec" quality

gears...machining and gear assemblies

Bear, Hobart, Worm, Straight and Spur;

Bevel, Spur, Worm, Gear, Gearing

A customer for that needs the

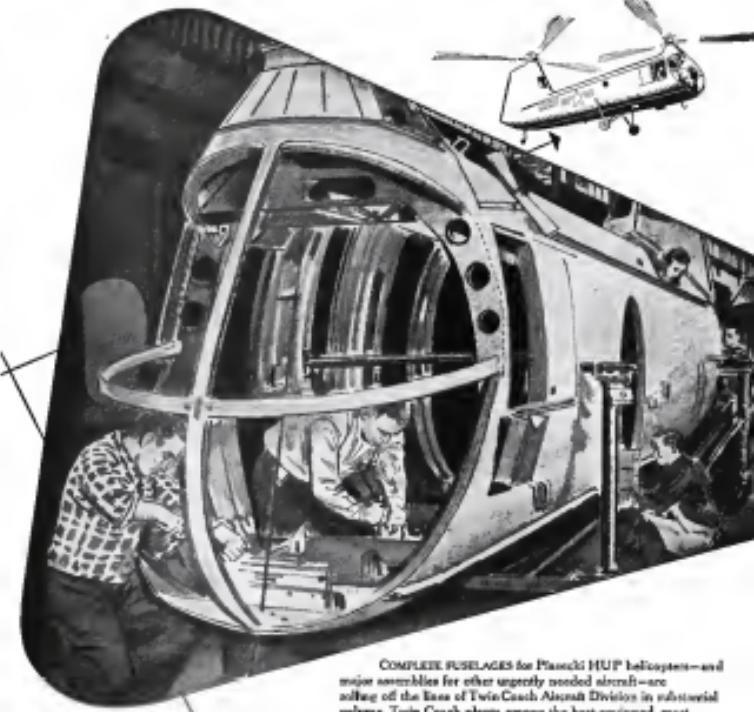
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AM gears

Quality is our goal

1022 West 110th Street, Chicago 46, Illinois
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AVIATION WEEK, April 12, 1958



COMPLETE FUSELAGES for Piasecki HUP helicopters—and major assemblies for other urgently needed aircraft—are being built off the lines of Twin Coach Aircraft Division in substantial volume. Twin Coach planes, among the best-equipped, most modern in the nation, are competently staffed by men who are the real early birds of the aircraft industry. Many have over 25 years of valuable aircraft experience. Modern facilities, modern equipment plus expanded manpower make Twin Coach a dependable source for every type of aircraft assembly.

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TWIN COACH COMPANY

Aircraft Division BUFFALO, N.Y.

AVIATION WEEK

AIRCRAFT ASSEMBLIES • MOTOR COACHES • TROLLEY COACHES • SUPER FREIGHTER CARGO TRUCKS
PAKAGE GASOLINE AND PROPANE ENGINES • PARSONS-LEYLAND DIESEL ENGINES



Jim Davis, building fuselage,
announced last year his first glider
in 1977 while still attending
high school. He has been in the aircraft industry
continuously ever since.



The Travel Card that gave "CREDIT" to the public

In 1934, when American Airlines issued the first credit card, proposed by C. R. Smith, an American sales manager, there was an immediate expansion of passenger traffic in the first class air travel field.

Up to then, all tickets had to be purchased by mail. This was a decided disadvantage to businesses

who found it necessary to carry large sums of money with them when they flew from one destination to another on an extended business trip. Credit cards developed easiness for the airlines from firms who had not previously encouraged their personnel to fly on company business. Airline credit cards have become so popular

and are now so widely used that they are accepted as evidence of credit at leading hotels and drive-year-self insurance agencies throughout the entire country.

The first instance of credit cards is only one of many instances in the history of air transportation introduced by American Airlines.



AMERICAN AIRLINES INC.
American Leading Airlines

on the full no-passenger principle. It can detect minute leaks in complete assemblies without the complete disassembly and may be used for check out of precision colors.

The tube body has a porous coating applied to it in an arrangement of pilot holes for diaphragm sealants, one for porous, another, for other oil. Settings of both sealants are about 10 to 15, the remaining 10.

Devon Engineering Co., 1701 Welshon St., Philadelphia 3, Pa.



Grind Mill Cutters

Better sharpening at low cost is obtained with new grinding fixture for both of shell mill, side both of side milling cutters and inverted tooth mill cutting patterns. Positive converts regular grinder into either grinder, who can be used on either grinder.

Originally developed for company's own use, fixture is now being marketed by Winkhoff Chuck Co., Ossining, N. Y.



Shaft Seal

A mechanical seal for shafts operating at high speed in small pumps and other other applications has been announced. The seal uses the basic idea of Teflon (the Bond) as a bearing surface. It has a housing around the shaft. It is possible for 1000 to 4000 rev/min. in vacuum operations and under pressure up to 200 psi. It withstands oils and acids.

Housings in various sizes as other seal can be supplied with the part. Seal is made in sizes to fit shafts of 1/4-3 and 5-in. diameter.

Coast Packing Co., 1600 Taylor Ave., Chicago 15.

SPDF Hermetically Sealed, Solder Type
Solder Type No. 4275B, AN3287-1

SPDF Hermetically Sealed, Solder Type
Solder Type No. 4057, AN3231-1

SPDF Sealed AH Connector Type
No. 4274B, AN3208-1

SPDF Hermetically Sealed, Solder Type
Solder Type No. 4031B

SPDF Sealed AH Connector Type No. 4023, AN3209-2

SPDF Hermetically Sealed, Solder Type
Solder Type No. 4048, AN3213-1

4PDR Sealed AH Connector Type No. 4038, AN3216-1

All the above Leach performances also characterize the following:
• Ground contacts
• 1000 rev/min. and 1000 psi.
• 1000 rev/min. and 2000 psi.
• 1000 rev/min. and 3000 psi.
• 1000 rev/min. and 4000 psi.

Leach

FOR AIRCRAFT

CONTROL CIRCUIT RELAYS

Hermetically Sealed and Sealed

AM, AH AND HAF APPROXIM. Illustrated above are but a few of the complete line of Leach hermetically sealed and sealed control circuit circuit breakers. There are many more of many important reasons why major aircraft manufacturers specify Leach relays: (1) to protect their product against (2) the extreme maintenance costs, (3) for lasting dependable performance, and (4) because they're built to exacting standards. Many modern aircraft are equipped with Leach relays that top other make.

For Better Controls through Better Relays — Specify Leach



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most compact elbow fitting



Resistoflex Hose Assemblies with sturdy forged aluminum elbows fit close quarters, eliminate adapters

Here are hose assemblies that can help you when space is at a premium. They have fittings for both ID and preset pitch to design more compact "plumbing" systems. Resistoflex Assemblies improve space factor even more when they replace combinations of swivel and hose assemblies and male adapters.

Resistoflex with true turns from solid forgings, Resistoflex Elbows assure full flow, maximum service, and extra resistance to fatigue.

And remember—Resistoflex Hose Assemblies with forged aluminum fittings have USAF and SealAir approval. Take advantage of our 4-year quantity manufacture of these aluminum elbows and their trouble-free service in jet engines and aircraft. Write for catalog.

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MADE FROM "TEFLON"® Fluorocell®** Teflon rings have optimum dimensional stability, maximum and least resistance. They're easier to install, reduce friction and improve life of the assembly. Get specifications—
write for Bulletin No PB-12.

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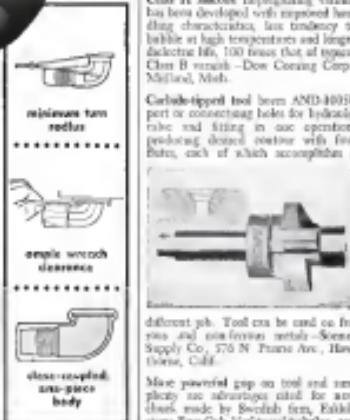
ALSO ON THE MARKET

Static characteristics of pressure and low-power selenium diodes can be measured with new DVE-100 tester designed with simplified controls to provide accurate results with minimum operation. —Teledyne Laboratories, Inc., 54 Kinnickinnic St., Westbury, N. Y.

Swedols metal-working machine for bending, straight cutting, circular cutting, nibbling and other work can be rapidly selected from job to job with a few simple tools and attachments. Made by GV Nibbler Co., St. Charles, Illinois, distributed in the U. S. by The S. Johnson Co., 730 S. Clark St., Chicago, Ill.

Clear H silicone impregnating varnish has been developed with improved bonding characteristics, low tendency to bubble at high temperatures and longer shelf life. 100 hours that of typical Clear B varnish. —Dow Corning Corp., Midland, Mich.

Carbide-tipped tool barre AND-40050 port or connecting holes for hydraulic tubes and fitting in one operation, producing desired contour with fine teeth, each of which accomplishes a



different job. Tool can be used on fittings and non-threaded metal. —Schoen Supply Co., 370 N. Prairie Ave., Hinsdale, Calif.

More powerful gap on tool and simplicity are advantages cited for any shear made by Swedish firm, Eskilstuna Kemi Oli. Vestigjolabodag, can be used in holes, rollers, bearing rolls, and other machines. —Distributed by Victor Machinery Exchange, Inc., 251 Centre St., New York 13, N. Y.

Delicate lapping, honing, filing and polishing can be done with Dr. Fräder tool bar which temperature maintains it up to 120°. —Höglund-Jaeger-Ehag Equipment Co., 451 S. Dearborn St., Chicago, Ill.

Sealings in hoses and materials are cleaned from use of Case-Flo Progressive betapoly betapolymer suitable for applying lacquers, enamel, paints—Spicer Co., 730 Full Ave., Houston, Tex.



AVIATION TURBO OILS

15 AND 35

The only lubricating oils pacing jet engine development

Esso Aviation Turbo Oils 15 and 35 are the only synthetic gas turbine lubricating oils in use today in substantial quantities which will stand up to the operating conditions of jet engines of enormous thrust now being developed. These oils are the direct outcome of technical research and foresight as the part of Esso aviation lubrication specialists working in close cooperation with British and U. S. aircraft engine designers and builders.

development of the Pratt & Whitney Aircraft J-57 jet turbine engine and an improved lubricating oil for this latest high-power axial-flow engine. E.A.T.O. 15 also is the only oil currently recommended for the Curtiss-Wright J-36 Sapphire jet engine for all power ratings.

For these reasons E.A.T.O. 15 and 35 are invariably used for the high-thrust jet engines now being developed in the U. S. and Great Britain—engines which have never known a mineral lubricating oil.

Why Synthetic Lubricants?

To meet the needs of today's gas turbine engines an oil must possess quite remarkable properties. Not merely must its viscosity-temperature characteristics be exceptional, but its pour point, flash point, volatility, high-temperature stability and load-carrying properties must all have advantages not possessed in combination by these lubricants formerly used.

The oil must permit rapid engine starting and be passable at all air temperatures. At the same time it must effectively lubricate the internal turbine bearings as both turbo-prop and turbo-jet engines at very high temperatures have the ability to maintain the perfect condition of the propeller reduction gears on turbo-prop installations.

These requirements are not readily fulfilled, and cannot be met completely by a number of even of the very highest quality.

But Esso Aviation Turbo Oils 15 and 35 satisfy them all.

Fully Proven Lubricants

Recognizing these facts at an early stage in gas turbine development, Esso research houses in Britain and the United States concentrated their efforts in producing synthetic oils equal to these new needs. These results are Esso Aviation Turbo Oils 15 and 35, aircraft lubricants of proven efficiency.

E.A.T.O. 35 is now generally used in all latest types of gas turbine engines tested and flown in Britain. It is a fact that some of the latest British engines would be unable to run at full power without using E.A.T.O. 35. E.A.T.O. 15 meeting Pratt & Whitney Aircraft specification P&W-A-55A was used during the testing and

Leadership in research and
product development are good reasons why
of all the world's international
airlines, **7 out of 10** use



AVIATION PRODUCTS

AIR TRANSPORT

Board May Delay Nonsked Action 2 Years

- CAB wants to continue investigation of irregular carriers 18-24 months before handing down decision.
- Third round of hearings is scheduled to open next month in Miami with testimony of large carriers.

By Lee Macrae

LITTLE change in Civil Aeronautics Board policy as regards of novelized service systems in prospect last week is the Board closed the second round of Washington hearings on its "large carrier carrier investigation." CAB proposed to continue the proceeding another 18 to 2 years before making a decision.

The Board will have first testimony from the large domestic non-sked in this case at Miami, where hearings are slated to resume about May 1. Next scheduled appearance: Modern Air Transport, Portland, Prudential Air Transport and Southeast Air Transport.

In Washington, Transocean Air Lines and Trans-Caribbean Airways both proposed to the Board that not the smaller domestic non-skeds still propose for debate a new plan of CAB regulation. Thus far, the case continues as a fact-gathering investigation rather than a case to decide new policy—the ultimate aim when the case started six months ago.

New developments in hearings due in Washington:

- CAB staff charged plan to present a substantial witness to economic arguments made thus far by both established and non-sked carriers. This witness would have given a brief on how the proposed Board rule would affect the non-skeds in view of deregulation and regulation. Non-skeds had argued for Board of Air Operations enhanced whether it will take the stand before back to the carriers on Feb. 1st next year. Non-skeds are reported to get CAB views as they will know what to argue about. At its stand next year, the case is a recent iteration of sorts for the record.
- Some small non-skeds that have proposed for debate proposed plans of their own for more liberal and less vague regulation than the present step. They generally proposed limitations of from 8 to 10 flights a week between pairs of cities.
- Big domestic non-skeds generally refuse to propose new restrictions on

grounds they might limit expansion of their own frequencies or of any new free-enterprise rights, and since CAB ultimately needs to decide a new policy. CAB enforcement action against non-skeds (by flying out when they pass regulation) permit continuous unabated Latin American enforcement patrolling against the North American group for alleged noncompliance of Board regulations by grouping several carriers with one sites agreed.

• Federal courts recently upheld CAB power to reflect carriers to new business volume a clause, so long as the Board finds proper hearings. *Air Transport Associates*, Atlanta, sued, is scheduled to go out of business April 1, following a judgment by the Superior Court of CAB infringement of ATA operating rights.

• Two international non-skeds proposed that the Board lifts its ban on passenger carriage by non-skeds as international operation. Their plan generally proposed frequency levels about the same as now permitted domestically, but with some extra allowances.

• CAB hasn't acted on the examiner recommendation to dismiss Southeast & Western Airlines for failing to appear simultaneously in the second investigation.

• CAB staff charged plan to present a substantial witness to economic arguments made thus far by both established and non-sked carriers. This witness would have given a brief on how the proposed Board rule would affect the non-skeds in view of deregulation and regulation. Non-skeds had argued for Board of Air Operations enhanced whether it will take the stand before back to the carriers on Feb. 1st next year. Non-skeds are reported to get CAB views as they will know what to argue about. At its stand next year, the case is a recent iteration of sorts for the record.

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trips, and carriers are betting it will return to Washington again. However, the examiner report that knowledge the case as "too nebulous."

Meanwhile, two new plans were submitted to the Board by international non-skeds to compete for two routes of unregulated competition and a closed shop for price controls overseas.

Transocean proposed that two international charter operators unrestricted to frequencies and that carriers receive rates from three to six trips a month between any two points in the world. Transocean predicted Gwin Nathan proposed that upward flexibility in frequency levels be granted to individual airline business volume. Non-skeds now are prohibited from carrying passengers on international routes. The carrier and CAB said foreign governments should grant those rights in cases who can qualify as "Ships" for CAB certification.

• Trans Caribbean president O. Roy Clark proposed a 100-shareholder plan of \$120,000,000 to finance an international airline, and intention to use round trips a month between the home base and any of its foreign bases of the world. Trans Caribbean also said non-skeds must demonstrate "Ships" as sufficient equity capitalization of \$250,000 and operation of at least two aircraft.

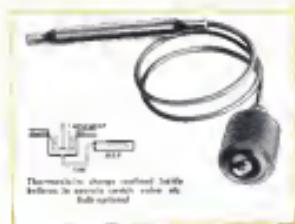
• CAB Non-sked Problem—CAB started this "large irregular carrier investigation" to find a new regulatory policy that would permit independent airlines to expand business without risking pre-empting competition with newly-qualified airlines.

The Board opened the case after the Senate Select Committee on Small Business of CAB of trying to resolve the non-skeds out of business. The Board excluded individual applications of all non-skeds because a federal court ruled against a CAB regulation restricting non-skeds from the previous Miami hearings for failing to present sufficient evidence. The case proceeds without them, pending CAB action. The four are Aero, Argonaut, Continental Charter and Miami Airlines.

• **Cab Schedule Delays**—CAB originally planned for the non-sked case to start in Washington, move to Miami and Los Angeles, and conclude in Seattle. Now it has been back and forth between Washington and Miami.

Position of CAB, non-skeds, sched-

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Civil Aeronautics Board Calendar

Emergency hearings, continue:

- Large cargo plane policy investigation 1012, terminate in Washington and proceed to Miami two weeks later (dockets not yet designated). Return to Los Angeles, Seattle, and return to Washington. Examiners Richard Walsh and Ralph Wahr.
- Trans-Canada negotiations 1041 et al. in progress. Robert Brown.
- Trans-Canada negotiations 1042 et al. in progress. Robert Brown.
- Portland-Seattle service case 1061 et al. May 16. Marvin Bullock.
- General passenger fare investigation 1038. May 1. Marvin Bullock.
- West Hollywood overflight 1059 et al. May 6. James Kirk.
- South Pacific Air Lines-Hawaiian Society blockade case 1049. May 12. Curtis Henderson.
- Texas Pacific state case 1050 et al. June 1. Thomas Ward.
- West Coast Buses case 1059 et al. June 12. Thomas Wren.
- U.S. Alaska state case 1076 et al. July 1. Francis Brown.
- Alaska Airlines will rate 1071. Aug. 5. Edward Stroh.
- Hearings, accident investigation:
- Transair Air Lines DD-8 and Alvarado, Calif., SA-274. Lexington Hotel, Oakland, April 18. Presiding officer Van R. O'Brien.
- Civil segments before Board, consent:
- Trans-Canada Airlines recent general 1033 et al. April 21.
- Continental Air Lines Wichita-Tulsa-Dallas route 1034 et al. April 30.
- Civil segments before Board, safety enforcement:
- Pan American World Airways-Corporation certificate resolution 103.166. April 16.
- Policy speech. CAB Member Joseph Adams, Oakland Chamber of Commerce, April 15.

uled surface in the angular corner
overhangs.

• Domestic Operations—Caravan
aircraft restricted to “intermediate and
trunk-line flights,” which CAB may veto
as far as five to 10 flights a
month between two cities, regardless of
number of places the carrier operates.

Weakened government contract
value is not avoided by the Board’s
economic regulation. Defense Dept.
must now reaffirm its policy of
letting air transport contracts in the low-
est responsible bidder, regardless of
whether CAB has revoked the carrier’s
letter of delegation for flying too much.

Small passenger airports asked CAB
to define “intermediate” trips as up to 12
miles apart. Lost and found, the
Board is likely to interpret “interme-
diate” of whatever. At present, about
four flights a month can count as too
regular if all flights are on the same day
of the week.

Big nonlocals asked CAB to follow
the recommendation of the previous
Senate-Senate Small Business Com-
mittee recommendation that “inter-
mediate” trips be defined as at least 54.4
15 a month and that the bus be re-
sible schedule be lifted. The large
operators who had applied for the
regulation on a per route instead of per
route basis to permit some annual
business incoercible to expand service.

• International Operations—Preliminary
CAB policy on international nonlocals
probably passenger operation entries
including charters such as student, club,

exec and business tour. Freight is
restricted to “intermediate and angular
flights. Both a carrier and government
can control and cooperate. Right
now, that the international freight in-
creases definitely. Government con-
tract flights are permitted as both pass-
engers and freight government agency
contract awards are beyond CAB eco-
nomic regulation.

International operators asked pass-
enger rights similar to those granted
domestic carriers. On freight, most
of them have application in the current
or open) trans-Atlantic cargo car-

• Domestic and International—School
and urban and rural areas to reduce num-
ber to contract flights only.

Nonlocals asked CAB to permit it to stay in
and repeat wherever less than an average
time that it started and discontinued.

Civil Aviation Act leaves it up to the

• Civil Aviation Act leaves it up to the
Board to permit Board to exempt or not
restrict airline CAB believe will serve
the “public convenience and interests.”

Associations May Merge

Av. Coast Transport Assn. recently
proposed merger with Independent
Military Air Transport Assn.

The two organizations presently co-
ordinate passenger air charter
contracts through a joint control board.
ACTA has 39 carriers and sub-operatives
about 60 field offices, mostly at or near
Army and Naval bases. IMATA repre-
sents 14 carriers and processes Air Force
and Marine business.

Pacific Aircoach

- Plane travel to Hawaii
now double ship traffic.
- PAA and United carry
17,400 in four months.

Air travel to and from Hawaii and
the U.S. is unusual, with a recent sharp
rise from low-cost aircraft fares, has
created a sense of interesting pleasure.

Surprisingly, a combination of tourist
flights by Pan American World Airways
between the U.S. mainland and Hawaii
for Dec. 1 has caused an airship down-
turn from its regular freight business
over the same route.

Pan American and United Air Lines
account for the bulk of all air traffic
moved in that area. In recent years, as
airing to available flights, United has
now more passengers between Hawaii
and the U.S. mainland than Pan American.

The lead now has been threatened
by Pan American's earlier start with
aircoach service. However, United has
entered its own busier service. Mar. 22
and is making a strong bid to overtake
Pan American's initial advantage in the
field.

• Since Pan American's tourist
service has been highly successful. For
the four-month period ended Mar. 28,
a total of 5,387 passengers were carried
on this long-haul service. During the
same period, 3,089 passengers used Pan
American's first-class service. In contrast,
during the same approximate period
a year ago 3,674 passengers flew
over the same route in the first-class
service. It is reported that Pan Ameri-
can's introduction of aircoach has had
some but not a serious diminution effec-
tive on United.

An aircoach seat is as spacious
as a domestic first-class seat and
the greater the number of seats the
more the cost. The cost will be at hand
with both carriers providing one possible
competitive answer. United, however,
is flying DC-8s in a 60-seat configuration
with increased seating. Pan American is flying the Starliner with
an 80-seat configuration in a series of
three-deck seating arrangements. The
aircoach fare is the same for both car-
riers, \$125 (including round trip),
against a first-class tariff of \$168.

Initially the bulk of traffic by air
has caused a severe damage to hotel
facilities. In many after noted resort
areas, such as Miami, special private
hotels or houses have been developed as
compensation with hotel interests to
minimize losses in 60 per hotel rooms
during off-season periods. In Hawaii,
the cost reverse is true. Lack of hotel

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subsidized coach-type service should be granted.

"Even if it's assumed that the regulators have 'permitted' this type of service and have spared the certificated carriers from forced efforts to do it up, Ryan stressed, the demand of business passengers in traffic would exceed the relatively low level of the certificated carriers in regard to some small non-hub airports."

• The Board should not consider part airplane violations of regulations in weighing certification cases.

In considering flights and flights to engage in air transportation, the Board should consider violations of law as "one factor" but "not a bar to the grant of authority," Ryan said.

Pioneer Challenges

CAB Martin Ruling

Pioneer Air Lines, Inc., went challenging the Civil Aeronautics Board decision finding the company's proposal for Martin Air Lines' new long-haul DC-3s to be "unfit" for an acceleration of the CAB decision. Pioneer and the \$1,600,000 proposal will be set by the Board last month as too low for DC-3 operation if the airline is to expand service.

The CAB ruling held that the Martin Air Lines' proposal to local service points and bypasses should not undermine a Pioneer experiment to prove 20:00 will be more economical than DC-3s on short haul routes in the long run.

Pioneer's position cited no major reasons why it believes G-48s should be chosen over the added \$1 million round trip.

• Increased first year passenger load would not be recovered. Pioneer's own cost study for 20:00, of \$57,712,000, increased it to \$67,728,000 after an analysis of Martin's operation, and finally added \$7,317,000 for non-revenue reduction problems. "During its first six months of Martin service, Pioneer . . . was completely suspended for the sudden im-

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gas turbines which no airline passenger ever could have reasonably imagined," the airline said.

• DC-3 costs "will continue well in excess of \$1 million a year without any proposed air reductions."

• Revised statement for Martin costs during the first year period "has back Pioneer's timetable to progressive and fair reductions by early next year."

• "Only reasonable prospect of economic self-sufficiency for Pioneer or any other local service airline lies in the conversion to other and more efficient equipment," Pioneer said. The Board previously has recognized this fact by supporting a proposed \$6-million proto-type appropriation for development of a new local service aircraft, Pitcairn agreed. The carrier and \$8 million would only be a start, and expenses would pay for more for prototype development before it started paying off through increased load per a load on less flying and reducing the plane.

• DC-3 service of Pioneer would be paid with dividends taken from the company's assets to service 11 cities first. But the project that is now Martin can handle substantially more traffic "at considerably lower passenger-mile costs and considerably reducing fuel requirements," Pioneer said.

• Martin costs are "unreasonable" with expenses of the other local industry DC-3 operation. Pioneer cuts an estimate of \$355,000 next year with Martin, compared to all DC-3 operations' average cost in Sept. 30, 1952.

Pioneer unit cost with 20:00 is \$19,515, fuel tax rate, 1.49 cents per available seat-mile and \$6.5 cents per plane mile.

DC-3 operations' unit cost \$21,577, fuel tax rate, 2.32 cents per available seat-mile and 9.62 cents per plane mile.

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SHORTLINES

► Air Transport Asia's freight agency, Air Cargo, Inc.—not against the Asian Trade Assn., Inc.—and the only result is to merge into Interstate Commerce Commission. Air cargo kept their greater earning freedom in freight pickup and delivery service.

► American Airlines, leading proponent for Civil Aeronautics Board switch-over to use of sales profit margin instead of rate of profit return on investment in reworking regulation, turned as a net profit margin of 6.6% on rates in 1952, compared with 6.5% in 1951. Revenues and expenses both grew 15%.

► British Overseas Airways plans to start its fourth international jet Comet serv-

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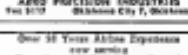
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C-47-A • DC-3-C

Manufactured October 1948. Power 2 X 1,450 H.P. Pratt & Whitney R-985-13. Fuel Capacity 1,000 Gals. Range 1,000 Miles. Max. Speed 210 M.P.H. Max. Altitude 20,000 ft. Max. Take Off Weight 25,000 lbs. Max. Landing Weight 20,000 lbs. Max. Fuel Consumption 100 Gals/Hr.

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LETTERS

Allisons & Cutlass

In your issue of *Aerospace Wkly*, Feb. 13, page 15, you placed a picture of the Navy's AT-3 Cutlass. Your statement is that the aircraft is designed for power plant trouble. We would like to point out that the aircraft is not designed for trouble, the trouble is caused by the engine, not the aircraft manufacturer.

As far as the failure statistics which were cited by your reporter, we shall be glad to call a public press conference.

C. B. V. Nease, Technical Director
Cutlass-Henderson Ltd.
Luton, Bedfordshire, England

Aerospace Wkly has solicited more report of the kind about Cutlass engines and we are awaiting your information. Also we hope you will do the same for us.

John S. Allisons
Allisons Aeropropulsion at
Cessna-Vought Aircraft
Dallas, Texas

From Mr. Lederer

Thanks for the editor's March 23 *Aerospace Wkly*. Your article prompted me to write a letter of my own, and I am glad you have published it.

This was one piece omitted in my section with my thanks to Mr. Lederer's Ed. When I comment on what today means in a different place, I also add "To the human eyes means that his wife will have to be satisfied with parts until he comes back."

Perhaps you are not aware that many United States airlines and KLM are also considering funds under the express condition that we would never accept funds that had strong attached to them. But Rich and I are working with a number of companies and government foundations that are helping in this regard.

The Council of Commercial Aviation Safety Comity complements the work of the Flight Safety Foundation for spearheading in the field of aircraft safety.

John E. Lederer
Chair, Special Services
Aviation Committee of Indiana
M1 W Washington
Indianapolis 4, Ind.

Praise

I enjoyed the article by Paul Miller on Cane in the Feb. 9 *Aerospace Wkly*. In fact, I can honestly say that I look forward to more of your excellent publications.

E. L. Potts
Aerospace Engineering Section
Government Site
General Electric Co.
Syracuse, N. Y.

Old Copies Available

I have the back issue of *Aerospace* magazine, from the time it was first published, and was a weekly magazine, up to about 1939. Would some collector care about this?

John M. Martin
Pittsford, N. Y.

AVIATION CALENDAR

April 19-21-Second signature man against conference, Management Division of The American Society of Mechanical Engineers, Boardwalk Hotel, Atlantic City, N. J.

April 20-21-Aeronautical Production Forum, National Aerospace Meeting and Aircraft Engineering display (SAAL), Hotel Congress, Clinton and Hotel Statler, New York.

April 20-21-15th Annual Conference of Technical Committees Interested in Transportation and Civil Aerobics, Hotel Statler, New York. The Transportation Symposium will be a principal feature.

April 21-24-SAC Annual General Meeting, Convention Center Hotel, New York, N. Y.

April 23-24-3rd Annual National Transportation Forum, Hotel Statler, Convention place of 300 lbs. or less. Philadelphia plus a Spring Conference sponsored by Philadelphia Junior Chamber of Commerce.

April 27-28-Java Thermodynamics Seminar, State University of Iowa, Iowa City.

April 29-30-1951 Electronics Computer Seminar, Institute of Radio Engineers, Stamford Club, Pasadena, Calif.

May 1-7-Second annual Shleby Derby, sponsored by Women Engineers. An open competition, organized by NAA and conducted under FIM rules. From Fort Smith, Ark. to St. Louis, Mo. on May 1 and returns to Fort Smith. NAA's research and development will follow at Fort Smith.

May 8-10-1951 City of Fort Worth Will Rogers Field, Oklahoma City, Okla.

May 11-13-National Conference on Advanced Electronic Devices, Electronics Bureau, Boston, Mass.

May 14-16-American Helicopter Society Forum, Maryland Hotel, Washington, D. C.

May 15-16-Youth Day, Los Angeles International Airport.

May 16-19th Annual Farnborough International Air Show, Farnborough, England.

May 18-20-1951 National Materials Handling Congress, McCormick Hall, Philadelphia.

May 19-22-Aerospace Seminar, National Fire Protection Assn. annual meeting, Palms Hotel, Chicago.

May 19-22-Second Congress, Aviation Week, Hotel New Yorker, New York.

May 20-22-1951 AIAA, IAE and IAE joint National Telecommunications Conference, Elgin Beach Hotel, Clevea, Ill.

June 11-13-10th annual All Women International Air Race, Woodland, Ont., in New Santa Fe Beach, Fla., sponsored by National Foundation.

June 15-17-1951 meeting of Aviation Distributors and Manufacturers Assn., Chateau Lake Louise, Alberta, Canada.

July 19-20-1951 Annual Seminars Meeting, Elgin Beach Hotel, Clevea, Ill.

Sept. 7-15-1951 SEMAC Congress Year Flying Display, Farnborough, Hampshire, England.

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AVIATION WEEK—APRIL 13, 1951

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EDITORIAL



Col. Joseph Adams in a Marine Helicopter

A CAB Member Who Gets Around

Col. Joseph Adams is one Civil Aviation Board member who seems about as transport first-hand Board members have been criticized by the airline industry ever since CAB was set up in 1938 because they have neglected a very dynamic business from amateur and staff research scientists. Only a few members and chairman have broken that ivy tower tradition.

Col. Adams not only came to the Board with a rich background of flying, but he is pushing it with up-to-date field study of such promising developments as the helicopter. He has returned from two weeks' active duty with Marine Helicopter Squadron No. 1 at Quantico, Va.

This group is developing and testing inconceivable uses of copilot support and control. In all, he has flown five copter types, including some experience he ran up as one Marine pilot last year.

His Marine Corps training, transport and creditable stands at 3,200 hr. in almost 50 types of aircraft, but the colonel is not content to have his CAB members and voting on the part. He believes that a firsthand knowledge of the remarkable helicopter, for example, will be important to him and the industry the Board regulates. Certainly the copter will perceive a vigorous role in commercial air transportation within a few years.

The inspiring attitude already has won him pals from the Helicopter Council of the Aircraft Industries Assn. In this area, B. L. Whelby, expresses the Council's feelings that way:

"It is most commendatory that a man in Col. Adams' position of responsibility in relation to the aviation industry chooses to determine for himself the basic facts regarding helicopter construction, operation, and performance. The helicopter presents an entirely new facet of air activity. It is related to the airplane only

in that it operates in the same medium. In all other respects it is an entirely new vehicle and should not be burdened by the restrictions necessarily imposed on other forms of air transport. After all, when the auto replaced the horse it was not required to carry oats and a feed bag, and the excuse for grazing gave way to a garage for parking. Col. Adams now is in a position to recognize the difference between the horse and the auto."

We hope Col. Adams continues his firsthand briefing tours, and that he will influence his fellow members to leave their chairs in the Committee Room, and see what makes this great air transport industry tick, and learn what problems keep it from moving ahead faster than its current pace. If he can do this, some of those Board decisions of the future will sound much more realistic.

Reconciling All Views on Jets

It is another bright sign of the Air Line Pilot Assn.'s increasing maturity and foresight that it has polled members on their recommendations for the first American jet transport planes which will be built. As reported elsewhere in today's *Aerospace Week*, these suggestions have been screened by the engineering staff of the union. Obviously, no commercial plane can be designed, built and operated according to the desires of the pilots alone. And undoubtedly a few of the suggestions will receive a cold reception initially, in some operation, sales and production circles.

Few commercial products being built today represent as many compromises as the airplane, and the jets, with their new restrictions and involved problems, will demand unprecedented cooperation of all groups in commercial air transportation.

Set certainly it is true that the increased precision and importance of the piloting job, and the tremendous cost of each plane, make it mandatory that we give more consideration and thought to the needs and wishes expressed by pilots than we have ever done before in the construction and operation of any other transport type. The recent Chicago meeting of ALPA officials with industry have already set the pace for peace and harmonious discussion.

We have faith in the fitness of the aircraft industry, the airlines and the flight crews to work out new configurations of aircraft that will set records in efficiency, economy and safety for jet equipment.

This crucial designing job seems even more important than the success of our visiting American production knowledge, if we are to beat the British products, take their five-to-ten-year lead, and clinch anticipated leadership in this dramatic and important international race.

—Robert H. Wood

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